

AUDUBON GUIDES

*All the Birds of Eastern
and Central North America*



THE BOUNDARIES OF THE LIFE ZONES SUPERIMPOSED ON A MAP OF THE NORTH AMERICAN BIOMES







Papier
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Audubon Guides

ALL THE BIRDS
OF EASTERN AND CENTRAL
NORTH AMERICA.

by Richard H. Pough

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AUDUBON BIRD GUIDE:

SMALL LAND BIRDS

and

AUDUBON WATER BIRD GUIDE:

WATER, GAME AND LARGE LAND BIRDS

Many people ask what they can do to assist in the cause of conservation of birds and other wildlife. One of the best suggestions is that they support the work of the National Audubon Society, 1130 Fifth Avenue, New York 28, N.Y., and local Audubon societies. These and other conservation organizations deserve your aid.

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Introduction

IT IS VERY GRATIFYING to be able at last to provide you with one book covering all the birds of North America east of the Rockies. Here you will find one or more colored pictures of 533 species and a wealth of interesting facts about each. With it, learning to identify birds will be just the beginning of your enjoyment. *Audubon Bird Guide* emphasizes characteristics by which birds may be identified almost as readily as by their appearance or song. Knowing where to look for each kind is half the trick of being an expert "birder," so special attention has been given to defining the type of area where each bird makes its home.

This book is designed to introduce you to one of the most satisfying of all hobbies—a hobby that will take you out of doors, sharpen your senses, and challenge your skill. Each season will offer its opportunities for recording birds not previously encountered. Every trip from home will become an adventure—a scientific expedition in miniature. Familiar countrysides will take on new interest and your search for new species will lead you to out-of-the-way beauty spots you never knew existed.

Best of all will be a growing feeling of kinship with all living things and a perspective on human affairs that will do much to release the tensions of our too hurried, crisis-ridden world.

The small land birds, and the water, game, and large land birds are each complete sections in this book with individual Tables of Contents and Indexes and for handy reference are separated by a colored sheet.

Audubon Bird Guide

SMALL LAND BIRDS

The map reproduced on the front end paper of this book shows two commonly used systems for dividing North America into natural areas.

Dr. C. H. Merriam believed that temperature factors are of major importance in determining where a given plant or animal can live. On this basis he divided the continent into 7 east-west belts that he called Life Zones. The distribution of many birds will be found to coincide closely with these Zones.

More recently, Dr. V. E. Shelford has suggested that the observable uniformity that exists in the plant and animal life over extensive areas is a better guide. On this basis he has divided the continent into 12 plant-animal community units that he calls Biomes. The boundaries between these units is usually gradual resulting in broad transition zones but in some cases it is surprisingly sharp. The distribution of most bird species coincides quite closely with one or more of these Biome units.

Audubon Bird Guide

SMALL LAND BIRDS

of Eastern & Central North America from
Southern Texas to Central Greenland

by Richard H. Pough

RESEARCH ASSOCIATE, NATIONAL AUDUBON SOCIETY

AND

CURATOR OF CONSERVATION,

AMERICAN MUSEUM OF NATURAL HISTORY

*With illustrations in color
of every species
by Don Eckelberry*

SPONSORED BY

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DOUBLEDAY & COMPANY, INC.

GARDEN CITY, NEW YORK

Audubon Bird Guide

SMALL LAND BIRDS

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To my mother and father who initiated
me into the happy fraternity of
naturalists.

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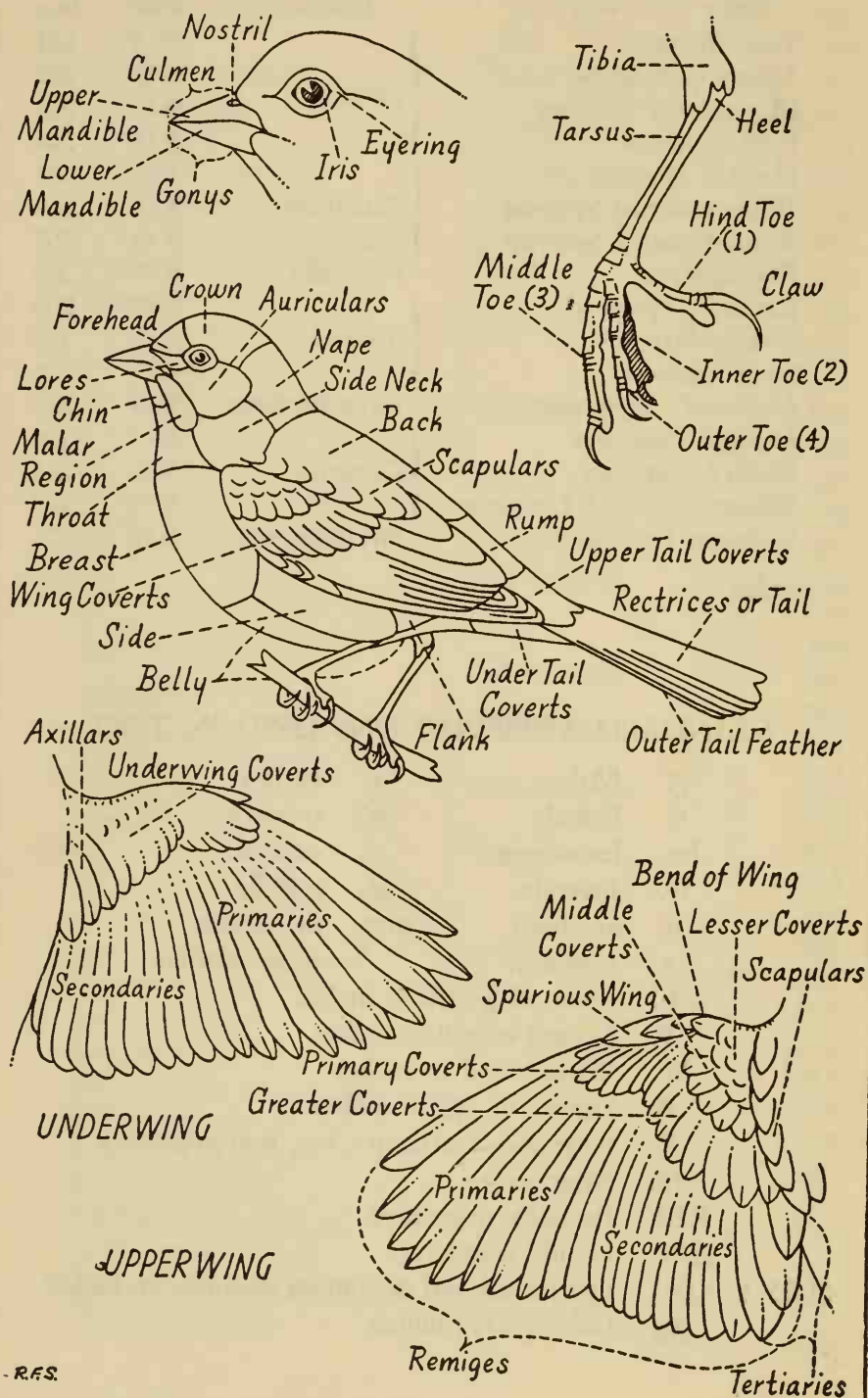
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STANDARD ABBREVIATIONS USED IN TEXT

♂	Male	e.	eastern
♀	Female	w.	western
Im.	Immature	c.	central
Jv.	Juvenile	m.	middle
n.	northern	mts.	mountains
s.	southern	*	Sexes similar
L.	Over-all length in inches		
T.	Length of tail in inches		
W.	Wingspread in inches		
B.	Length of bill in inches		
R.	Permanent residents, i.e., non-migratory		
M.	Migratory		
P.M.	Partially migratory		
E.W.	Erratic wanderers		
(1.25 x 1.06)	Egg length and maximum diameter in inches		
//	Color plate number		

TOPOGRAPHY OF A SONGBIRD



Foreword

THE study of birds is much more interesting if you know certain general facts. This Foreword proposes to give you some of these facts and to show you how to use this book to the best advantage.

AREA: The area covered (some five million square miles) is eastern North America north of Mexico, excluding East Greenland. The line dividing eastern from western North America is taken as the eastern edge of the semi-arid Great Plains, where the tall-grass prairie country meets the drier, short-grass plains. In the United States it corresponds approximately with the one hundredth meridian running north through central Texas, western Oklahoma and Kansas, central Nebraska, and the Dakotas. In the Prairie Provinces of Canada, where the Great Plains end at the edge of the Hudsonian Forest, it swings sharply west and closely parallels the eastern side of the Rocky Mountain system almost to Alaska. The line roughly marks the westward range limit of many of the most typical birds of the humid East, but is far enough east to exclude most of the distinctly Western birds, except for species that roam far out across the grass-covered lowlands in winter.

SCOPE: All birds are classified in a systematic series. The position of any bird in the general scheme is determined by its degree of specialization. Fossil remains show that birds were originally less highly specialized than they are now. Some water birds are still relatively simple, but most land birds are exceedingly complex. The standard classification

begins with the more primitive birds like loons and grebes and ends with the most highly specialized—the sparrows.

The first and broadest of the groupings are called orders. Within the orders, closer relationship is expressed by the term family. Families are divided into genera and genera into species. The species describes the individual bird. It is a natural biological unit. It reproduces its own kind and, no matter how much two birds may look alike, they are not of the same species if they live in the same area and do not interbreed. This book follows the sequence of orders, families, genera, and species established by the American Ornithologists Union in their check-list (fourth edition).

The birds (estimated as between twelve and fifteen billion) that regularly spend at least part of the year on the American continent north of Mexico, frequent its coastal waters, or appear as occasional visitors are currently divided into 700 species, of which 525 occur more or less regularly in eastern North America. Many of these also occur in western North America, in addition to the 175 species confined to that area. Of those found in eastern North America, 275 are the land birds—our common song and insectivorous birds—with which this book is concerned. They belong to the last eight orders of the A.O.U. check-list, some 228 of them (83 per cent) to the last order (passerine or perching birds), which includes more species than all other orders put together.

BIRD NAMES: Every bird has a scientific name formed of Latin and Greek terms. The name of a species consists of two words. The first, which is capitalized, is its generic or group name and is the same for all species in a genus. The second, which is not capitalized, is the bird's specific name; each species has its own.

Most species in North America also have an English name agreed upon by the A.O.U. and published as part of its check-list, but other common names are often popular

in different sections of the country. Those in widespread use are listed in the Index with a reference to the bird's standard A.O.U. name.

Since this book is concerned only with species, it is unnecessary to do more than point out in passing that many species are now being subdivided geographically into subspecies or races. In most cases the differences are so minute as to have no significance in the field, and in some instances the question of whether to regard two similar but geographically separated bird populations as two distinct species becomes a matter of judgment. (See Ipswich and Savannah sparrows.)

Unfortunately, ornithologists themselves have further confused bird nomenclature by giving some of the subspecies English names which make them appear to be full species. In some cases the subspecies are specifically designated while the species itself is left without a distinctive name. Where this is true the author has chosen a name (he hopes a logical one) for the species as a whole. In a few cases where the A.O.U. name makes the bird seem a member of a race when it is actually a member of a full species, the name has been modified or changed for the sake of clarity. To avoid any possible confusion, where more than one species bears the same name, as with the crows, each is given a distinctive first name.

VARIATIONS IN APPEARANCE: It is important to remember that a bird may not look the same the year round and that male and female may not look alike. Where sexes have virtually the same appearance, the bird's name is followed by an asterisk (*).

A young bird may not look like either parent, but if there is a difference between the sexes it usually resembles the female.

Newly hatched birds may have more or less natal down. This is quickly replaced by fluffy body feathers, referred to as *juvenile plumage*; in this they leave the nest. By the

time it is fully developed the bird has achieved full growth; it is as large as it will ever be.

Shortly after they are able to fly most species molt all juvenile plumage except wing and tail feathers. The next plumage, which they wear until the end of their first winter, is called the *first winter plumage*. In this the young again may or may not look like their parents. To add perplexity, males and females are often alike in this plumage even when they become quite different as adults. This and subsequent plumages which are different from adult plumage are referred to as *immature*, and the birds themselves are called *immatures*. In their first spring immatures go through another molt of varying completeness. This gives them their *first nuptial plumage*. In some species, e.g., orioles, the male's first nuptial plumage is not as brilliant as in its second, third, and fourth years.

After it becomes adult the average bird has two molts a year—a late-summer post-nuptial molt in which all feathers are renewed, and a pre-nuptial molt in late winter or early spring. The latter is highly variable, only a few birds undergoing complete change, including wing and tail feathers. Most birds change only the body plumage, and in some species, like the English sparrow, all brightening is due to the wearing off of dull feather tips.

Freak birds with white or paler-than-usual feathers are not uncommon, and complete albinos are occasionally found. A rarer variation is *melanism*, in which darker feathers replace those of normal color. A few birds, like the screech owl, occur in two colors or phases, irrespective of age or sex.

COLOR PLATES: The color plates in this book are a key to the birds. Every distinct plumage is illustrated except the juvenile. During the short period it is worn the birds are best identified by their close association with their parents. Usually the plumage extremes of any species are represented by the adult spring male and the immature female.

If other plumages are so close to one of these as to be unmistakable, they are not shown. Figures not labeled as to season may be assumed to be in spring plumage. If not labeled as to sex, adults can be assumed to be virtually alike. If there is a marked difference between sexes in immature plumage, the duller female is usually shown and so labeled. All birds on a plate, except the crow-jay plate, are drawn to the same scale.

Familiarity with the color plates will greatly increase the usefulness of this book. To add further value, it is suggested that you go over it species by species, checking the ranges as you go along, and mark in some way the birds apt to be in your locality. A convenient way is to underline the birds you may expect, using a distinctive color for each seasonal group: red for permanent local resident; green for summer resident; blue for migrant; brown for winter visitor; and some other color for accidental visitors driven in by storm or other disturbance. Check-lists of local birds are available for most areas and can usually be obtained in a public library. If not, write to the National Audubon Society, 1000 Fifth Avenue, New York 28, New York.

MEASUREMENTS: In making an identification it is important to note the bird's general size. Keep in mind a few standard lengths: house wren 5 inches; English sparrow 6 inches; robin 10 inches; blue jay 12 inches; crow 20 inches. In the text the average length from tip of bill to end of tail (L.) is given. Where the ratio of tail length to over-all length has a decided effect upon the bird's appearance, the tail length in inches (T.) is given. If a bird is most commonly seen in the air the spread from wing tip to wing tip (W.) is given. Egg measurements are in inches, the maximum long diameter or axis by the maximum short diameter or thickness. All dimensions are average.

VOICE AND SONG: Many land birds are more frequently heard than seen, and a knowledge of their songs is of the utmost

value. In most cases songs are as diagnostic as appearance and in a few cases, as with the small flycatchers, more so. Unfortunately, songs are hard to set down in print. Aretas A. Saunders has been more successful than anyone else to date in *A Guide to Bird Songs*, a work to which the author of this book is much indebted.

Actual bird songs are available on phonograph records. These are very useful if you wish to memorize a few songs before going afield or to refresh your memory on songs you have forgotten, but the best way of all is to listen to the bird itself. When you hear an unfamiliar song, run the bird down until you have identified it by sight. Then listen to its song for twenty-five or even fifty repetitions. It sometimes helps if in the cadence you can detect the rhythm of words, like the barred owl's *Who cooks for you, who cooks for you all?* or the white-throated sparrow's *Old Sam Peabody, Peabody*.

PSYCHOLOGY AND BEHAVIOR: The study of birds has been greatly handicapped by a tendency to interpret their behavior according to human standards. This is a mistake. Birds are creatures of instinct, and the whole pattern of their lives is determined in advance by their inheritance. They have no power of thought as we understand it.

Apparently a newly hatched bird inherits everything it needs to carry out every step in its life cycle, even when it includes long migration flights, elaborate nest building, or any one of hundreds of other equally complex performances. These potentialities may be likened to coiled springs. The spring is motionless until it is released, but once released by some stimulus the bird is under an almost irresistible compulsion to continue the chain of action to the end. Some birds, for example, as soon as incubation is well under way, will sit on almost any object that may be substituted for its eggs.

Birds are no less fascinating because they act like automats; that is, like birds instead of people. If anything,

they are much more so. On their own level their lives are endlessly amazing.

ENJOYING BIRDS: Birds are our most conspicuous and most readily observed form of wildlife. Everyone is aware of them in the spring when their bright colors, lively movements, and chorus of song render them inescapable, but some birds are present at all seasons. Making the acquaintance of the common varieties in your neighborhood is an excellent way to establish a closer bond with nature. It will give you an understanding of that feeling of kinship with the denizens of the wild, so characteristic of primitive peoples, and you will gain an awareness of the order in the world of living things and a perspective on human problems and concerns that are beyond price. It is no accident that so many of our great men have been keen students of wild birds. Few forms of outdoor recreation have so much to offer.

The search for species that are new to you can become an absorbing pastime. Learning to recognize by sight and sound the birds in your immediate vicinity will give you many pleasant hours out of doors. It is unnecessary, even undesirable, to try to cover as much ground as possible in order to see a great many different species. One of the best methods is to pick out a comfortable place in an interesting habitat and sit quietly. If you make no sudden movements the birds will soon be oblivious of your presence.

Your study of birds can be valuable to science as well as delightful to you. There is so much we still do not know that anyone with a little time can make worth-while contributions to the sum total of our ornithological knowledge. Probably the greatest need is for intensive behavior studies of our common birds. These can be made wherever birds are found. There is also need for more careful and more detailed censuses of bird populations throughout the year in relatively small areas, especially areas representing a

single, homogeneous type of wild plant and animal life. A yearly calendar of the comings and goings of migrant species is always interesting.

SEEING BIRDS: Birds are elusive, but there are many ways of overcoming their shyness. They have excellent eyesight and hearing but little or no sense of smell. A strange object in their vicinity often causes fright or resentment, but if the object remains stationary they soon ignore it. Slow, deliberate movements are generally overlooked, but quick movements always attract attention. Be still if you can. If you must move, do it slowly while the bird is feeding or otherwise distracted.

Sounds, especially if loud, may startle birds momentarily, and a loud clap of the hands as you cross an open meadow or marsh will often flush into view birds that were hidden in the grass. However, the ordinary reaction to sound seems to be curiosity. Some birds will investigate any strange sound, but certain sounds are more effective than others in bringing them near. One is a squeak or a squeaky kiss made by sucking air thorough closely pursed lips, preferably with the lips against the back of the hand. Another is an imitation of the screech owl. This is made by blowing air out in a low whistle through saliva cupped on the fore part of your tongue. If you throw your head back slightly the air bubbling through the saliva will produce the characteristic quavering of the call. In many instances the best lure is an imitation, no matter how crude, of the bird's own call. Success depends upon the accuracy of your imitation and the degree of stillness you can maintain.

Birds will come back again and again to a given spot for food and water. These can be just outside your window or in a place you visit regularly for observation or photography. The food to offer depends upon the birds. For seedeaters, foxtail millet (*Setaria italica*), also known as German or Hungarian millet, is good. Beef suet is a

favorite with insect eaters, and many birds relish sunflower seeds, peanuts, peanut butter, and stale doughnut crumbs. Fruit eaters will usually come for raisins, dried apples, and bananas. Some birds, especially the Northern finches, seem to crave salt and will be attracted by salty foods.

In providing water for drinking and bathing, use a shallow container with a rough bottom and a gently sloping edge, and remember that some birds will use a raised birdbath while others will not. Whether level with the ground or raised, it should be near a shrub in which the bird can sit to dry off after its bath. Water dripping into a pool from a can or faucet will attract many more birds than still water.

Many birds can be encouraged to nest if you put up suitable boxes or otherwise fill their special nesting requirements. Particulars are given in the paragraphs on habits.

BINOCULARS: For serious field work a binocular is almost indispensable. This will be your major tool and should be chosen with the utmost care. A good one is expensive, but it is a lifetime investment and worth every penny of its cost.

Not every binocular is suited to bird work. To bring the bird close enough for a really good look you need at least a six-, if not an eight-, nine-, or ten-power glass. A six-power glass means that the distance between you and the bird is divided by six; if the bird is thirty feet away it will appear to be only five feet away. Eight-, nine-, and ten-power glasses further decrease the apparent distance (divide the actual distance by eight, nine, and ten respectively), but the higher-powered glasses are more difficult to hold steady. Every slight motion of the observer makes the bird appear to move six, eight, nine, or ten times as much, depending upon the power of the binocular.

The bird must not only appear to be close, it must be well

illuminated. If it is in full sunlight almost any binocular will do, but if it is in deep shade or the sky is overcast you need a glass that collects as much light as your eye can use. For all-around use on dark as well as sunny days, your binocular should have "objectives" (front lenses that collect light) with a diameter in millimeters about five times the power of the glass. Thus, a 6-power binocular should have an "objective" 30 millimeters in diameter. An 8 x 40 magnifies eight times and has an "objective" 40 millimeters in diameter.

A third important factor in choosing a binocular is the "field of view." The greater the field, the greater the area (a flock of birds or a whole treetop, for instance) you can watch without moving the glasses. A large field of view makes a glass easier to handle, since the observer need not be so accurate in his aim. The field is broad enough to include the bird, though it may not be in the exact center. Breadth of field is determined by the optics of the binocular and bears no fixed relation to the size of the objectives or the power of the glass, but in general the greater the power, the narrower the field. With an eight-power glass you cannot expect a breadth of field of more than 15 feet at a distance of 100 feet. An unusually fine glass may have a 20-foot field of view, but only in a low-power model. The manufacturer often expresses the field of view as 150 feet at a distance of 1,000 feet or 450 feet at 1,000 yards. The ratio is the same.

For the sake of your eyes, buy a good binocular. Be sure that it has a center focus wheel to focus both eye-pieces simultaneously. Make certain that it is in alignment, that the center of the field of each of the two sides falls upon the same point. Your eye muscles can pull the fields together, but it is a strain. If you wear spectacles have the eyecups of the binocular cut down until they permit the lenses of your spectacles almost to touch the lenses of the binocular. Otherwise you lose part of the field of view you should be getting.

REGIONAL BIRD DISTRIBUTION: Everyone knows that different species of plants and animals live in different parts of the country. Some fifty years ago Dr. C. H. Merriam advanced the theory that these differences were largely the result of differences in average temperatures and proposed that seven broad east-west life zones be recognized in North America, beginning with the Tropical Zone in southern Florida and continuing through the Lower Austral, Upper Austral, Transition, Canadian, and Hudsonian zones to the Arctic Zone. According to his theory, the average temperatures at the edges of the zones represented the critical temperature limits beyond which the zone's characteristic animals could not survive. It is becoming increasingly clear, however, that the apparent conformity of many bird species to these life zones is based less upon temperature sensitivity than upon their affinity for communities where certain types of plant life are dominant. Often plants of the same life form, e.g., grassland, forest, etc., are inhabited by the same birds even when they are in widely separated temperature zones.

More recently a proposal has been made that the continent be divided into natural units based upon the vegetation with which nature finally clothes undisturbed land, the vegetation which no other plant species can dislodge. Such a climax growth may be a deciduous or coniferous forest, a grassland, or open tundra. The word "biome" was coined for these units, and individual biomes are given names based upon their most characteristic plants and their most distinctive resident animal. The distribution of some birds coincides quite closely with the extent of a biome unit, but not of all birds. The value of both concepts—life zones and biomes—is that they help to show that bird distribution is not haphazard but subject to controlling factors. (See end paper map.)

LOCAL BIRD DISTRIBUTION: The modern biologist considers all the plants and animals living together in a certain spot as

members of a wildlife community. The simplest way of designating a community is to call it by its dominant plant life—grassland, forest, marsh, or swamp. In any region there are usually many different types, depending upon differences in soil, wetness or dryness, and the degree of disturbance by man, fire, or flood. Generally each type has its characteristic birds, and these may or may not have a relation to the life zone or biome in which it lies.

The trend of any community is always toward the climax vegetation, which is usually forest or grassland. Not every forest or grassland represents a climax community, but the Northern spruce-fir forest and, somewhat farther south, the forest of beech and sugar maple are the ultimates for their respective areas; west of the beech-maple country, in a region of limited rainfall, lie the natural grasslands.

All communities except those at climax are subject to change unless man stabilizes them. Most of our native birds are therefore members of unstable communities. Over this they have no control; they simply expand or contract their populations according to the prevalence of the community they require, and the bird life of any area may change completely within a very short time.

The natural succession of plant life on abandoned ground in the once-forested East begins when the bare ground is clothed with weeds. Weeds frequently give way to grass. Shrubs and young trees shade out both, and a brushy stage appears, then a dense stand of young trees and finally a mature woodland. The first forest on abandoned land is invariably composed of trees with sun-loving seedlings, the second (often the climax) of those with shade-tolerant seedlings. Often the natural succession is retarded by lack of sufficient soil, by dryness, or by a water table too close to the surface, as with a swamp forest, but each successive plant stage, whatever it may be, has its characteristic bird life.

The paragraphs on habits in this book define as closely as possible the kind of wildlife community in which each

species can be expected; they should also enable you to judge how permanent a bird is likely to be as the resident species of a given area and to predict what other birds are likely to come in as the plant succession advances. Clear cutting of forests, fire, overgrazing, soil erosion, and other forms of land abuse, though bad in terms of human economy, often increase certain species of wildlife since they provide community types that would otherwise seldom be encountered. Today it is probably safe to say that for every land bird that is less abundant than it was when the Pilgrims landed, five or six are more abundant.

"HABITAT" REQUIREMENTS: Every species of animal inherits certain habits, instincts, and abilities which admirably adapt it for life in a certain community. These attributes change little from generation to generation, and they are usually so highly specialized that the animal is not able to survive for long in any other type of community. When a bird's range is given in this book it is not implied that it occurs everywhere, or even widely, within the specified area, but only where its special community requirements are met. The older way of expressing this restriction was to speak of the bird's "habitat," but this tended to ignore the mutual interdependence of the bird and the other members of the wildlife community.

"Habitat" requirements are most critical during the breeding season. In winter most birds retain community preference but are more readily lured elsewhere by an abundant supply of attractive food. In migration they seldom have a choice. Most land birds migrate at night and drop to earth wherever daybreak overtakes them. They select the nearest spot that makes them feel at home and gives them food enough to continue their flight.

TERRITORIAL NEEDS: During the breeding season most song-birds require a territory over which the resident pair has undisputed ownership against others of its kind. Generally no attention is paid to members of other species (but see

house wren). This habit may have arisen as a means of assuring an ample food supply for a nestful of hungry young, but today it seems largely instinctive and entirely without reference to the food supply. Territorial defense is primarily the male's job, but the female sometimes assists. The song that delights our ear during the breeding season, poets to the contrary, appears to be a proclamation of ownership and a warning to other males not to trespass.

Once a pair has proved its claim to a territory, it shows a strong attachment for it. In the case of very sedentary species the birds may remain in it the rest of their lives. In the case of migrants the male commonly returns to his old territory and defends it against newcomers. The female returns also, but if a rival appears ahead of her she may have to look for another mate. A bird's territorial attachment is so strong that if it is captured during the breeding season and taken some distance away before it is released, it will "home" with amazing speed. Often a bird will remain even after its territory is so drastically altered by lumbering, clearing, or building as to be no longer a very suitable habitat, the particular individual or pair coming back as long as they live.

The size of the defended territory varies from species to species, and there are minor variations in the acreage any given pair tries to claim. During the breeding season a pair of red-shouldered hawks needs about one square mile while a pair of ovenbirds needs only about an acre. Thus ovenbirds would not be abundant unless there were approximately 640 pairs per square mile, while red-shouldered hawks would be abundant if there were one pair within the area.

OTHER SPECIAL REQUIREMENTS: Food is seldom the only or even the most important factor limiting a bird to a particular community. The many detailed studies that have been made of the foods of various species reveal a fairly wide choice within certain categories—insects, seed, or fish.

Birds do seek variety sometimes, but in general they take from a wide range of acceptable items whatever is at the moment easiest to get. Thus, their food may vary greatly from day to day, season to season, and place to place.

The crucial habitat need may be for a very special kind of nest site or nesting material, for a suitable lookout or singing perch, a night roost, or a patch of escape cover. As these vary to the point of being unique with each species, they are discussed under the individual bird in the main body of the book. Their special interest lies in the fact that man is often responsible for their presence or absence.

SEASONAL MOVEMENTS: Some birds remain in one locality throughout their lives. Others migrate in winter to areas far south of their breeding grounds. The first are generally spoken of as residents, noted in this book by (R.), the second as migrants (M.). Many species fail to give such clean-cut examples. Migrants may be summer or winter residents, depending upon the location. Often a bird appears to be a migrant only in the northern part of its range and a more or less permanent resident farther south. Often it is difficult to know whether this indicates a southward shift of the whole population or whether there are two population groups, one migratory, one sedentary. At any rate, breeding birds appear south of the normal range, and there are species where the most northerly breeders are the ones that winter farthest south. Such species are referred to in this book as partially migratory (P.M.).

A few species wander erratically except during the breeding season, pausing wherever they find suitable food. As the majority of these erratic wanderers (E.W.) belong to the North, most of us see them only in winter. Because of their irregularity in any given locality they are often called winter visitors rather than winter residents. Another group of erratic wanderers are Southern species, chiefly herons, which breed early and come North during the summer in numbers that vary greatly from year to year.

In the section on range, if a bird is a permanent resident, its over-all range is given. If it is a migrant, its breeding range is given first, followed by its winter range, in which case it can be assumed that it is a migrant between the two. Only where breeding and wintering ranges are widely separated and the birds follow a rather well-defined route between the two is the route specified. For dates of arrival and departure one should consult a local check-list or, preferably, make one's own.

ECONOMIC RELATIONS: In books of an earlier period birds were often arbitrarily classified as good or bad, beneficial or harmful, according to their feeding habits. Such designations are valid only where man's economic interests are directly involved. A great horned owl, for example, is "bad" when it takes a chicken from its roost, "good" when it removes a woodchuck from your garden. The truth is that a bird or any other animal in the wild is one of the many cogs in a beautifully balanced, smoothly running assemblage of wild creatures. Every member of the group must be present if the population equilibrium necessary to the health of the community is to be maintained.

A wildlife community begins with plants. Plants create organic material, the foodstuff of life. They take a gas (carbon dioxide) from the air, water and minerals from the soil, and, using the energy of the sun, combine them in organic compounds. From these compounds, in their original or in altered form, comes the substance from which all plant and animal tissue is made. A food chain begins when a plant is eaten by an animal, keeps on when that animal is eaten by another, the second by a third, and so on until the body-building, energy-supplying foodstuffs are transmitted to many members of the wildlife community.

This chain which binds the community together is called predation. Unpleasant as it may seem, the relation of predator to prey, eater to eaten, is perfectly natural. Without it there would be no wildlife except plants and no

wildlife communities. In community terms there are no good or bad birds, but simply wild birds, each living according to the behavior pattern of its kind, a pattern which evolved as the species evolved, in response to the laws of nature.

The science which deals with plant-animal relationships is called ecology. A newcomer among sciences, it has only recently begun to reveal the inner workings of wildlife communities and to explode some of our misconceptions. Once, for example, the claim was popular that man had irretrievably upset the balance of nature; a simple calculation can prove its absurdity. Take any common bird or other animal, figure out its theoretical rate of reproduction, and count the descendants it would have in ten years if normal mortality was absent. In the case of the fairly long-lived, two-brooded robin the astounding total is 3,906,250 birds! Obviously (though from year to year there are minor variations in the robin population) the general level is maintained by such balancing factors as predation, disease, and starvation.

In a healthy wildlife community each animal lives upon the surplus produced by the species upon which it feeds; i.e., upon individuals which in the absence of predation would die of starvation, starvation-induced disease, or inter-species strife. Once the surplus is removed, a law of diminishing returns begins to act against the predator. The death rate of the prey-population becomes extremely low, and some of the predators become surplus and suffer the fate of all animals that exist in greater numbers than their food supply can support. The predator becomes prey.

Popular belief to the contrary, no predator ever seriously threatens the survival of the species upon which it preys. The normal population of insect-eating birds, for example, helps keep insects down to normal levels, but the birds must allow some insects to mature as breeding stock or doom themselves to starvation during the next season.

In towns and villages dogs and cats kill large numbers

of birds just out of the nest and some adults, but many naturalists doubt if their toll exceeds, or even equals, that of wild predators in remote sections where dogs and cats are not a factor. Seldom do wild and domestic predators prey on the same population, since wild predators generally avoid the thickly settled areas where dogs and cats are abundant.

CONSERVATION: Man with his guns, traps, hooks, nets, and poison has proved himself a most efficient killer of wildlife. The decimation of species after species during the last century shows what happens when he is not restrained. Many bird species, once valued for food, eggs, or plumage, exist today only because an aroused public opinion finally brought about the enactment of protective laws and the will to support them.

Many birds have been persecuted because of damage to crops or livestock. The only parrot native to eastern North America, the beautiful Carolina parakeet, was exterminated because it raided crop fields and was easy to kill. Most of our hawks and owls take quantities of rodents and in some cases insects as well, but because certain species nab an occasional chicken, all are condemned and destroyed by those who know not what they do.

The least excusable threat to bird life is wanton shooting for the sake of a live target, a practice that is hard to condone on any grounds. In the old days travelers stood for hours at the rails of river steamers to shoot passing birds "for the sport of it." Such destruction was not confined to riverbanks, and a few of our birds have never recovered from it. One is our handsome bald eagle, our national emblem, which is now protected by Federal law. Another is the graceful swallow-tail kite, which is gone from 95 per cent of its former range, though it is a perfectly gentle species. Fortunately, this type of hunting is largely a thing of the past, but there are still people who carry loaded guns in their automobiles to shoot hawks off telephone poles

along the highway, and there are still irresponsible hunters and unthinking boys who take a shot at any bird that happens to fly within range.

Much more threatening to bird life than willful destruction of non-game birds and reckless overhunting of game species are the changes incidental to modern industry and agriculture. Some that have received the most publicity are probably the least serious. Water birds, as every newspaper reader knows, are especially vulnerable to floating oil sludge. Lighthouses, highways, and tall buildings levy an annual toll, but up to the present these losses seem to have been offset by the surplus produced during the breeding season. This is not stated to minimize the danger. Every reasonable precaution should be taken. At any moment these losses, coupled with the normal losses from other causes, may be great enough to imperil the survival of the species.

For many birds the gravest threat is destruction of the only type of wildlife community in which they can live. Every year extensive areas of fresh- and salt-water marshes are drained, flooded, or ditched for mosquito control. When the marshes vanish our shore birds, rails, ducks, herons, and other attractive species, vanish with them. Sometimes this cannot be helped, but in every region at least a few samples of every original type of bird habitat should be preserved. This can be effectively achieved by the establishment of public and private refuges, wild parks, and public hunting grounds.

Increasingly dangerous to bird life are the new insecticides, rodent and weed poisons, with which man can control virtually to the point of extermination all forms of wildlife that he considers undesirable. In nearly all wildlife communities the chief converters of vegetation into "meat" are insects and rodents. If they go, the whole carnivorous section of the community—songbirds as well as owls, foxes, and other animals—must of necessity go with them. If the seed- and berry-bearing "weeds" of crop

fields and fence rows are eliminated, even our seed-eating winter birds must decrease in numbers.

Conservation problems are becoming more urgent. Transportation which makes even the most remote areas accessible, new inventions, increased leisure, and the short-sighted desire for quick profit all tend to increase the rate of exploitation of our remaining natural resources and the spoliation of our last remaining wildernesses. Government efforts are often thwarted by political expediency. To be effective conservation must have the support of every citizen interested in preserving his natural heritage.

BIRD CLUBS: Most of us find it pleasant and helpful to share our interests and enthusiasms with others. Audubon Societies, bird clubs, and ornithological groups exist in almost every state. Informal and open to everyone, these organizations provide contact with experts, aid in solving identification problems, and act as guides to the more interesting local bird habitats. Specialists like bird banders have their own societies. Many of these groups are engaged in co-operative projects, like censuses of local birds, in which everyone can participate. A number of them publish small magazines or occasional reports on special studies. If you have any difficulty in getting in touch with those in your area, write to the National Audubon Society in New York, where a complete and up-to-date record of all local bird groups is kept.

There are four large national groups that welcome anyone interested in birds: the American Ornithologists Union, with headquarters at Lancaster, Pennsylvania; the Cooper Ornithological Club, Berkeley, California; the Wilson Ornithological Club, Ann Arbor, Michigan; and the National Audubon Society, 1000 Fifth Avenue, New York 28, New York. Each publishes a magazine which you will find listed under periodicals in the bibliography at the end of this book. A letter to the editor will bring you full details about membership.

Acknowledgments

IN PREPARING THIS BOOK I have drawn freely upon the literature on North American birds which has been accumulating for more than two hundred years. I myself have had the privilege of studying birds in every state of the union, but I have made full use of the recorded observations of others. Only in this way would it be possible for anyone to present a well-rounded picture of each species throughout its range.

I owe an especial debt to Arthur C. Bent, whose *Life Histories of North American Birds*, published in many volumes by the United States National Museum, provide a thorough abstract of the extensive and widely scattered literature on birds. I have also found extremely useful the monumental works of Thomas S. Roberts and Edward H. Forbush, authors, respectively, of *Birds of Minnesota* and *Birds of Massachusetts*. In addition I wish to express my appreciation of Roger T. Peterson's *A Field Guide to the Birds* and Aretas A. Saunders's *A Guide to Bird Songs*. Since publication they have been my constant companions in the field, and I know they have improved the quality of my field work. My range paragraphs are an abbreviation of the data in the fourth edition and more recent supplements of the American Ornithologists Union's *Check-list of North American Birds*.

Don Eckelberry, in my opinion, has made an outstanding contribution to ornithology in his illustrations for this book. On his behalf and my own I wish to thank the American

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RICHARD H. POUGH

April 1946

Pelham, New York

Combined Color and Size Key to Small Land Birds

Birds are adult males unless otherwise specified. Dimensions are over-all lengths in inches. As standards of comparison use these common birds—Golden-crowned Kinglet 4", Yellow Warbler 5", English Sparrow 6", Wood Thrush 8", Robin 10", and Blue Jay 12".

1. CONSPICUOUS AMOUNTS OF RED, PINK, OR PURPLE

Body all or partly bright red—Painted Bunting $5\frac{1}{4}$ "; Vermilion Flycatcher 6"; Scarlet $7\frac{1}{4}$ " and Summer $7\frac{1}{2}$ " Tanagers; Cardinal $8\frac{1}{4}$ ".

Body extensively suffused with red or pink—House Finch $5\frac{1}{2}$ "; White-winged 6" and Red 6" Crossbills; Purple Finch $6\frac{1}{4}$ "; Gray-crowned Rosy-finch $6\frac{1}{4}$ "; Pine Grosbeak 9".

Extensive areas of red or pinkish on head—Hoary 5" and Common $5\frac{1}{4}$ " Redpolls; European Goldfinch $5\frac{1}{2}$ "; Pyrrhuloxia 8"; Common Sapsucker $8\frac{1}{2}$ "; Golden-fronted $9\frac{1}{2}$ ", Red-bellied $9\frac{1}{2}$ ", Red-headed $9\frac{3}{4}$ ", Pileated 17", and Ivory-billed 20" Woodpeckers.

Red confined to small area on back of head—Varied Bunting 5"; Downy 6", Mexican $7\frac{1}{4}$ ", Red-cockaded $8\frac{1}{4}$ ", and Hairy 9" Woodpeckers; Yellow-shafted Flicker 13".

Throat only pink, purple, or red—Black-chinned $3\frac{1}{4}$ ", Ruby-throated $3\frac{1}{2}$ " and Rufous $3\frac{1}{2}$ " Hummingbirds; Rose-throated Becard $6\frac{1}{2}$ "; Rose-breasted Grosbeak 8".

Red or pinkish chiefly on or under wings—Redstart $5\frac{1}{2}$ "; Red-winged Blackbird $9\frac{1}{2}$ "; Red-shafted Flicker 13"; Scissor-tailed Flycatcher 14".

2. CONSPICUOUS AMOUNTS OF ORANGE

Body extensively orange—Baltimore $7\frac{1}{2}''$, Bullock's $8''$, Hooded $8''$, and Lichtenstein's $9''$ Orioles.

Orange areas on head—Blackburnian $5\frac{1}{4}''$ and Prothonotary $5\frac{1}{2}''$ Warblers; Western Tanager $6\frac{3}{4}''$; Carolina Parakeet $12\frac{1}{2}''$.

Orange on sides of breast—im. Redstart $5\frac{1}{2}''$.

3. CONSPICUOUS AMOUNTS OF BRIGHT OR PURE YELLOW

Body largely yellow—Common Goldfinch $5''$; Yellow Warbler $5''$; Black-headed Oriole $9''$.

Yellow confined chiefly to head regions—Verdin $4\frac{1}{4}''$; Golden-cheeked $5''$, Black-throated Green $5''$, Chestnut-sided $5''$, Golden-winged $5''$, and Brewster's $5''$ Warblers; Three-toed $8\frac{3}{4}''$ and Black-backed $9\frac{1}{2}''$ Woodpeckers; Yellow-headed Blackbird $10''$.

Under parts almost wholly pure yellow—Dark-backed Goldfinch $4''$; Blue-winged $4\frac{3}{4}''$, Nashville $4\frac{3}{4}''$, and Wilson's $5''$ Warblers; Yellow-throat $5\frac{1}{4}''$; Mexican Ground-chat $5\frac{1}{2}''$; Kentucky Warbler $5\frac{1}{2}''$; Chat $7\frac{1}{2}''$; Olive-backed Kingbird $8\frac{1}{2}''$; Kiskadee Flycatcher $10\frac{1}{2}''$.

Yellow under parts with dark markings—Prairie $4\frac{3}{4}''$, Cape May $5''$, Magnolia $5''$, Palm $5\frac{1}{4}''$, Canada $5\frac{1}{2}''$, and Kirtland's $5\frac{3}{4}''$ Warblers; Dickcissel $6\frac{1}{4}''$; Western $9\frac{1}{2}''$ and Eastern $10\frac{3}{4}''$ Meadowlarks.

Yellow chiefly on throat and/or breast—Pitiayumi $4\frac{1}{2}''$, Parula $4\frac{1}{2}''$, Yellow-throated $5\frac{1}{4}''$, Sutton's $5\frac{1}{4}''$, and ♀ Prothonotary $5\frac{1}{2}''$ Warblers; Yellow-throated Vireo $6''$.

Yellow chiefly or wholly on rear under parts—Bachman's $4\frac{1}{4}''$, Lawrence's $4\frac{3}{4}''$, Hooded $5\frac{1}{2}''$, Mourning $5\frac{1}{2}''$, Connecticut $5\frac{1}{2}''$, and Macgillivray's $5\frac{1}{2}''$ Warblers; Cedar Waxwing $7\frac{1}{4}''$; Western Kingbird $9''$; Ash-throated $8\frac{1}{4}''$, Crested $9''$, and Mexican $9\frac{1}{2}''$ Flycatchers.

Birds with patches of yellow—Bahama Bananaquit $5''$; Audubon's $5''$ and Myrtle $5\frac{1}{2}''$ Warblers; ♀ Redstart $5\frac{1}{2}''$; Evening Grosbeak $8''$.

4. CONSPICUOUS AMOUNTS OF BLUE OR BLUE-GRAY

Wholly blue—Indigo Bunting $5\frac{1}{2}$ ".

Blue associated only with white or gray—Cerulean Warbler $4\frac{1}{2}$ "; im. Indigo Bunting $5\frac{1}{2}$ "; Mountain Bluebird $7\frac{1}{4}$ "; Scrub $11\frac{1}{2}$ " and Blue 12" Jays; Belted Kingfisher 13".

Blue or blue-gray with some other color or black—Brown-headed Nuthatch $4\frac{1}{4}$ "; Blue-gray Gnatcatcher $4\frac{1}{2}$ "; Red-breasted Nuthatch $4\frac{1}{2}$ "; Blue-throated Blue Warbler $5\frac{1}{4}$ "; White-breasted Nuthatch 6"; Eastern Bluebird 7"; ♀ Belted Kingfisher 13".

Dark blue often appearing black in poor light—Blue Grosbeak 7"; Barn Swallow 7"; Purple Martin 8".

5. BLACKISH OR CONSPICUOUSLY BLACK AND WHITE

Uniformly dark often with iridescence—Brown-headed 8" and Red-eyed $8\frac{1}{2}$ " Cowbirds; Starling $8\frac{1}{2}$ "; Rusty $9\frac{1}{2}$ " and Brewer's $9\frac{1}{2}$ " Blackbirds; Common Grackle 12"; Groove-billed 12" and Smooth-billed $13\frac{1}{2}$ " Anis; Boat-tailed Grackle $16\frac{1}{2}$ "; Fish 17" and Common 19" Crows; White-necked 20" and Common 25" Ravens.

Large black and white areas on body producing a bold pattern—Morelet Seedeater 4"; Snow Bunting 7"; Spotted $7\frac{1}{2}$ " and Eastern 8" Towhees; ♀ Three-toed Woodpecker $8\frac{3}{4}$ "; Loggerhead Shrike 9"; ♀ Black-backed Woodpecker $9\frac{1}{2}$ "; Northern Shrike $10\frac{1}{4}$ "; ♀ Ivory-billed Woodpecker 20"; Black-billed Magpie 20".

Black and white markings largely or wholly on head—Black-capped Vireo $4\frac{1}{2}$ "; Red-breasted Nuthatch $4\frac{1}{2}$ "; Carolina $4\frac{1}{2}$ " and Black-capped $5\frac{1}{4}$ " Chickadees; Black-throated Sparrow $5\frac{1}{2}$ "; Black-crested Titmouse $5\frac{1}{2}$ "; Chestnut-colored $5\frac{3}{4}$ " and McCown's 6" Longspurs; White-breasted Nuthatch 6"; Lapland $6\frac{1}{4}$ " and Smith's $6\frac{1}{2}$ " Longspurs; White-throated $6\frac{3}{4}$ ", White-crowned 7", and Harris's $7\frac{1}{2}$ " Sparrows; Horned Lark $7\frac{3}{4}$ "; Canada Jay $11\frac{1}{2}$ ".

Black and white markings confined to wing or tail area

—Northern Wheatear $6\frac{1}{4}$ " ; im. Common Sapsucker $8\frac{1}{2}$ " ;
Lark Bunting 7" ; im. Red-headed Woodpecker $9\frac{3}{4}$ ".

Fine broken or speckled over-all black and white pattern

—Black-throated Gray $4\frac{3}{4}$ " , Black and White $5\frac{1}{4}$ " , and Blackpoll $5\frac{1}{2}$ " Warblers; ♀ Downy 6" , ♀ Red-cockaded $8\frac{1}{4}$ " , and ♀ Hairy 9" Woodpeckers.

6. PREDOMINANTLY GREENISH, DULL YELLOWISH, OR SOME TONE OF OLIVE-GREEN

Body extensively greenish or dull yellow both above and below—♀ Dark-backed Goldfinch 4" ; Buff-bellied Hummingbird $4\frac{1}{2}$ " ; Philadelphia $4\frac{3}{4}$ " and Bell's $4\frac{3}{4}$ " Vireos; im. Blue-winged $4\frac{3}{4}$ " and Orange-crowned 5" Warblers; Common Goldfinch 5" ; White-eyed Vireo 5" ; ♀ Painted Bunting $5\frac{1}{4}$ " ; im. Yellowthroat $5\frac{1}{4}$ " ; im. Blackburnian Warbler $5\frac{1}{4}$ " ; Pine $5\frac{1}{2}$ " , fall Bay-breasted $5\frac{1}{2}$ " , and Blackpoll $5\frac{1}{2}$ " Warblers; Yellow-bellied Flycatcher $5\frac{1}{2}$ " ; ♀ Red 6" and White-winged 6" Crossbills; Yellow-green Vireo $6\frac{1}{2}$ " ; ♀ Tanagers (3 species) $6\frac{3}{4}$ "– $7\frac{1}{2}$ " ; ♀ Evening Grosbeaks 8" ; ♀ Orioles (6 species) $7\frac{1}{4}$ "–9" ; ♀ Pine Grosbeak 9" ; Green Jay $11\frac{1}{2}$ ".

Greenish tone confined largely to upper parts—♀ Ruby-throated $3\frac{1}{2}$ " , ♀ Rufous $3\frac{1}{2}$ " , and ♀ Black-chinned $3\frac{1}{4}$ " Hummingbirds; Golden-crowned 4" and Ruby-crowned $4\frac{1}{4}$ " Kinglets; Tennessee 5" , im. Golden-winged 5" , ♀ Black-throated Blue $5\frac{1}{4}$ " , and Worm-eating $5\frac{1}{2}$ " Warblers; Warbling Vireo $5\frac{3}{4}$ " ; Acadian Flycatcher $5\frac{3}{4}$ " ; Olive Sparrow $5\frac{3}{4}$ " ; Ovenbird 6" ; Tree 6" and Bahama 6" Swallows; Northern Water-thrush 6" ; Blue-headed 6" and Red-eyed $6\frac{1}{4}$ " Vireo; Louisiana Water-thrush $6\frac{1}{4}$ " ; Black-whiskered Vireo $6\frac{1}{2}$ " ; Green-tailed Towhee $6\frac{3}{4}$ " ; Green Kingfisher $7\frac{1}{2}$ ".

7. LARGELY OR EXTENSIVELY GRAY

Almost wholly uniform grays although often paler below than above—Beardless Flycatcher $4\frac{1}{2}$ " ; Chimney Swift $5\frac{1}{2}$ " ; Rough-winged Swallow $5\frac{3}{4}$ " ; Wood $6\frac{1}{2}$ " and Western $6\frac{1}{2}$ " Pewees; Olive-sided Flycatcher $7\frac{1}{2}$ " ; ♀ Brown-headed

Cowbird 8"; juv. Starling $8\frac{1}{2}$ "; Townsend's Solitaire $8\frac{3}{4}$ "; Catbird 9"; ♀ Rusty $9\frac{1}{2}$ " and ♀ Brewer's $9\frac{1}{2}$ " Blackbirds; im. Canada Jay $11\frac{1}{2}$ ".

Uniform gray above, white or very pale below—♀ Verdin $4\frac{1}{4}$ "; Bank Swallow $5\frac{1}{4}$ "; Least $5\frac{1}{4}$ ", ♀ Vermilion 6", and Alder 6" Flycatchers; Slate-colored $6\frac{1}{4}$ " and White-winged $6\frac{1}{2}$ " Juncos; Eastern Phoebe 7"; Eastern $8\frac{1}{2}$ " and Gray 9" Kingbirds; Mockingbird $10\frac{1}{2}$ ".

Gray with some areas of color—Tufted Titmouse 6"; Pink-sided Junco $6\frac{1}{4}$ "; Gray-breasted Martin 7"; Say's Phoebe $7\frac{1}{2}$ "; ♀ Purple Martin 8"; Catbird 9".

Fine or broken gray pattern—juv. Cedar Waxwing $7\frac{1}{4}$ "; Screech 10", Snowy 25", and Great Gray 27" Owls.

8. EXTENSIVE AREAS OF UNIFORM BROWN

Bold pattern involving large areas of brown—Brown-capped Chickadee $4\frac{3}{4}$ "; Bay-breasted Warbler $5\frac{1}{2}$ "; Cave $5\frac{1}{2}$ " and Cliff 6" Swallows; Tufted Titmouse 6"; Pink-sided Junco $6\frac{1}{4}$ "; Barn Swallow 7"; Orchard Oriole $7\frac{1}{4}$ "; ♀ Towhees $7\frac{1}{2}$ "–8"; Robin 10".

Almost wholly brown although often paler below than above—♀ Morellet Seedeater 4"; winter Northern Wheatear $6\frac{1}{4}$ "; im. Gray-crowned Rosy-finch $6\frac{1}{2}$ "; ♀ Rose-throated Becard $6\frac{1}{2}$ "; Cedar $7\frac{1}{4}$ " and Bohemian 8" Waxwings; im. Saw-whet Owl 8"; Gray's Thrush 10"; im. Common Grackle 10"; ♀ Boat-tailed Grackle $12\frac{1}{2}$ "; Black-eared Cuckoo $12\frac{1}{2}$ ".

Uniformly brownish above, white or very pale below—Swainson's Warbler 5"; ♀ Varied Bunting 5"; ♀ Indigo Bunting $5\frac{1}{2}$ "; Olive Sparrow $5\frac{3}{4}$ "; juv. Scissor-tailed Flycatcher 7"; Black-billed $11\frac{3}{4}$ " and Yellow-billed $12\frac{1}{4}$ " Cuckoos.

Uniformly brown above, more or less speckled below—Veery 7", Hermit 7", Olive-backed 7", Gray-cheeked $7\frac{3}{4}$ ", and Wood 8" Thrushes; Sage Thrasher $8\frac{3}{4}$ "; juv. Robin 10"; Curve-billed 11", Long-billed $11\frac{1}{2}$ ", and Brown $11\frac{1}{2}$ " Thrashers.

9. FINE BROKEN PATTERNS COMPOSED LARGELY OF SMALL BROWN, BLACK, AND WHITE MARKINGS

Birds with an over-all broken brownish pattern—Cañon Wren $5\frac{1}{2}$ "; Ferruginous Pygmy Owl $6\frac{3}{4}$ "; Poorwill $7\frac{1}{2}$ "; Saw-whet Owl 8"; Trilling Nighthawk 9"; Burrowing Owl 9"; fall Rusty Blackbird $9\frac{1}{2}$ "; Whip-poor-will $9\frac{3}{4}$ "; Common Nighthawk 10"; Screech 10" and Boreal 10" Owls; Chuck-will's-widow 12"; Pauraque 12"; Hawk 12", Long-eared 15", Short-eared $15\frac{1}{2}$ ", Great Horned 18", and Barred 20" Owls.

Birds with light unstreaked under parts—Short-billed Marsh 4", Winter 4", House $4\frac{3}{4}$ ", and Long-billed Marsh 5" Wrens; juv. Henslow's 5", Grasshopper $5\frac{1}{8}$ ", and Chipping $5\frac{1}{4}$ " Sparrows; Bewick's Wren $5\frac{1}{4}$ "; Clay-colored $5\frac{1}{2}$ ", Field $5\frac{1}{2}$ ", and Rufous-crowned $5\frac{1}{2}$ " Sparrows; Brown Creeper $5\frac{1}{2}$ "; Swamp $5\frac{3}{4}$ ", Botteri's $5\frac{3}{4}$ ", and Cassin's $5\frac{3}{4}$ " Sparrows; Carolina Wren $5\frac{3}{4}$ "; ♀ McCown's Longspur 6"; European Tree 6", Pinewoods 6", Tree $6\frac{1}{4}$ ", Lark $6\frac{1}{4}$ ", and English $6\frac{1}{4}$ " Sparrows.

Birds with light under parts, speckled or streaked in whole or in part—Leconte's 5" and Henslow's 5" Sparrows; Pine Siskin 5"; juv. Grasshopper Sparrow $5\frac{1}{8}$ "; Baird's $5\frac{1}{2}$ "; and im. Rufous-crowned $5\frac{1}{2}$ " Sparrows; im. Cañon Wren $5\frac{1}{2}$ "; ♀ House Finch $5\frac{1}{2}$ "; Rock Wren $5\frac{3}{4}$ "; ♀ Chestnut-collared Longspur $5\frac{3}{4}$ "; Lincoln's $5\frac{3}{4}$ ", Savannah $5\frac{3}{4}$ ", and Sharp-tailed $5\frac{3}{4}$ " Sparrows; Seaside 6", Merritt Island 6", Cape Sable 6", and Vester 6" Sparrows; ♀ Lapland Longspur $6\frac{1}{4}$ "; ♀ Purple Finch $6\frac{1}{4}$ "; im. Dickcissel $6\frac{1}{4}$ "; Sprague's Pipit $6\frac{1}{4}$ "; Song $6\frac{1}{4}$ ", Ipswich $6\frac{1}{4}$ ", and im. Lark $6\frac{1}{4}$ " Sparrows; ♀ Smith's Longspur $6\frac{1}{2}$ "; Water Pipit $6\frac{1}{2}$ "; ♀ Lark Bunting 7"; ♀ Blue Grosbeak 7"; Fox Sparrow $7\frac{1}{4}$ "; ♀ Bobolink $7\frac{1}{4}$ "; im. Harris's Sparrow $7\frac{1}{2}$ "; ♀ Rose-breasted Grosbeak 8"; Cactus Wren 8"; ♀ Red-winged Blackbird $9\frac{1}{2}$ "; Barn Owl 18"; Road-runner 23".

Parrots and Allies

Order PSITTACIFORMES

PARROTS

Family PSITTACIDAE

Carolina Parakeet*

Conuropsis carolinensis—#10

IDENTIFICATION: L. 12½, T. 6½. The long pointed tail and yellow head, becoming rich orange around the bill, are unlike those of any other North American bird. Immature birds are green except for the orange forehead and lores.

HABITS: This gorgeous, hardy parrot was once abundant along river bottoms, where it fed on a variety of wild fruits and seeds in the forest and along the open riverbanks and bars. It was especially fond of the seeds of cocklebur, bur grass, and thistle as well as of pecans and beechnuts. In winter it ate the seeds of cypress, sycamore, and pine. It was gregarious throughout the year and, though non-migratory, flocks often wandered long distances in search of food.

The bird was ill adapted for survival under the conditions which followed the coming of the white man. It was edible, its plumage could be sold for millinery, it was in demand as a cage bird here and in Europe, and it was destructive to a variety of cultivated crops, including corn and other grains, apples, pears, and oranges. It needed hollows in great river-bottom trees for nesting and roosting and it was so attached to its companions that when part of a flock was shot the remainder came back again and again until all were killed. By 1860 it was gone from much of its range and by the '80s it could be found only

in sparsely settled areas. A few may survive in some remote southern swamp, but it is doubtful.

VOICE: A series of loud, discordant screams given continuously in flight.

NEST: They nested in hollow trees and laid 2 or 3 white eggs (1.35 x 1.10).

RANGE: (R.) Formerly from s. Virginia on the Atlantic coast and Ohio, Indiana, Illinois, Missouri, Arkansas, and e. Texas in the interior south to s. Florida and the Gulf Coast.

Cuckoo-like Birds

Order CUCULIFORMES

CUCKOOS, ROADRUNNERS, and ANIS

Family CUCULIDAE

Black-eared Cuckoo*

Coccyzus minor—#1

IDENTIFICATION: L. $12\frac{1}{2}$, T. 6. Even immature birds, without the black "ears" and gray crown of adults, have the characteristic buff under parts that distinguish this from our other cuckoos.

HABITS: It is a bird of low, dense thickets near the coast. In Florida, where it is a breeder and summer resident from March to September, the "mangrove cuckoo" is found chiefly in the tangles of red and black mangrove that border the west coast and extend into the shallow salt water. Like most cuckoos, it is an insect eater, feeding on hairy caterpillars, grasshoppers, and moths.

The occurrence of the bird in Florida represents the extreme northward range of an otherwise non-migratory tropical species. The individuals that visit Florida to breed are considered a distinct race or subspecies to which the name Maynard's cuckoo has been given. Possibly this race represents the first step in the evolution of a new migratory species.

VOICE: A slow, deliberate series of deep, guttural calls somewhat like the bark of a squirrel.

NEST: A flat mass of twigs in dense mangrove with 2 pale greenish-blue eggs ($1.22 \times .92$).

RANGE: (P.M.) The Florida Keys and west coast north to Anclote Keys, West Indies, Trinidad, n.e. South America, and Central America north to c. Mexico. Absent from Florida in winter.

Yellow-billed Cuckoo*

Coccyzus americanus—#1

IDENTIFICATION: L. $12\frac{1}{4}$, T. $6\frac{1}{4}$. This and the black-billed cuckoo closely resemble each other. They are slim, long-tailed birds that stay well hidden in foliage. They move deliberately when feeding, and when they fly it is with a fast, direct movement straight from the center of one tree to the center of another. Look for the rufous coloring in the wings which shows well in flight. The large white spots on the ends of the black tail feathers are also conspicuous. Less easily observed is the yellow lower mandible and the yellow eyelids.

HABITS: The yellow-billed is the more southern of the two cuckoos, but their ranges overlap. Both seem to have benefited from man, as they prefer dense tangles of second growth in rural areas and are seldom found in really deep woodlands. They find moist areas attractive and are usually common in streamside willow thickets. Brush-grown country roads and run-down orchards are also favored habitats. Cuckoos' chief food is caterpillars, and they are among the few birds that eat the very hairy species.

VOICE: A series of clucking notes with a hollow wooden quality. The most characteristic is a long series of clucks, fairly fast until the end, when they abruptly become slower and longer as they run down the scale.

NEST: A flimsy, almost flat platform of short twigs, usually rather thinly lined with soft material and placed 4 to 8 feet aboveground in a dense shrub or tree which is often thorny or evergreen. The 3 or 4 eggs ($1.22 \times .92$) are dull greenish-blue.

RANGE: (M.) Breeds from New Brunswick, s. Ontario, North Dakota and British Columbia south to the Florida Keys, the Gulf Coast, Tamaulipas, and s. Lower California. Winters from Venezuela and Colombia to Uruguay and n. Argentina.

Black-billed Cuckoo* *Coccyzus erythrophthalmus*—^{PA}1

IDENTIFICATION: L. $11\frac{3}{4}$. Both mandibles are black. The eyelids form a red ring around the eye. Better characteristics are the slimmer build, the lack of rufous in the wings, and the narrow white tips of the gray-brown tail feathers.

HABITS: The feeding habits of the two cuckoos appear identical, but the black-billed seems fonder of extensive woodlands and more active at night.

Unlike the European cuckoo, American cuckoos only occasionally lay their eggs in the nests of other birds. When they do the young cuckoo usually succeeds in throwing out the other young and usurping the attention of its foster parents. The species imposed upon include chipping sparrows, yellow warblers, catbirds, wood thrushes, and even other cuckoos. A young cuckoo is naked and coal black, but within six days it bristles with quill-like feather tubes. These it removes with its bill, exposing the fluffy juvenile feathers. By its seventh to ninth day it is an active little bird, climbing about the branches. If it drops to the ground it is able to mount quickly into the shrubbery.

VOICE: A long series (sometimes up to several hundred) of evenly spaced soft notes, of uniform pitch, single or in groups, with almost the quality of a low whistle. Frequently they are preceded by a few harsh notes, but there is never an ending like that of the yellow-billed.

NEST: A rather more substantially built nest than that of the yellow-billed and more amply lined with soft material; placed 2 to 4 feet off the ground in a dense clump of woody growth. The 2 or 3 eggs ($1.09 \times .82$) are of a

blue-green color averaging darker than those of the preceding species.

RANGE: (M.) Breeds from Prince Edward Island, s. Quebec, and s.e. Alberta south to North Carolina, Georgia (mts.), Arkansas, and Kansas. Winters in n.w. South America south to e. Peru.

Roadrunner*

Geococcyx californianus—#1

IDENTIFICATION: L. 23, T. 12. The most striking feature is the long tail. The wings are short and rounded with a curved white line running through them. Both wings and tail are more used for steering and quick turns than flight. The long powerful legs are another distinctive feature. The tracks are unmistakable, as two toes point forward and two backward.

HABITS: In many areas this bird goes by the name of "chaparral cock." Since it is shy and spends most of its time on the ground, where it can run as fast as man, it is hard to see. Only with difficulty can it be flushed into a short flight which generally ends in the nearest thicket.

Open country with scattered cover is its chosen habitat. Insects are its staple food, especially grasshoppers and crickets, although it will eat any insectlike animal large enough to be worthy of notice, even poisonous scorpions, centipedes, and tarantulas. It also catches small snakes, lizards, mice and other rodents, and occasionally birds. Because sportsmen have accused it of destroying quail eggs and young, careful studies have been made of its food habits. These indicate that such depredations, if they occur, are so infrequent as to have no appreciable effect on the quail population. This is fortunate, as it would be a tragedy to exterminate this amusing bird. All in all he is one of our most delightful bird characters, with his comical way of swinging his great tail and raising his rough crest as he peers from side to side.

VOICE: The roadrunner makes a variety of noises variously described as clucking, crowing, cooing, and a whining like a puppy. His spring song is a series of coo or ook sounds, loud and rather hoarse, which run down the scale, the whole performance being repeated over and over again.

NEST: A compact flat mass of sticks lined with soft material, usually well hidden in shrubbery or low trees from a few feet aboveground to about 15 feet. The 3 to 5 eggs (1.55 x 1.20) are chalky-white or slightly ivory.

RANGE: (R.) From s.w. Kansas, s. Utah, and n. California south to Mexico City, and east to c. Texas and the Gulf Coast of s. Texas.

Smooth-billed Ani*

Crotophaga ani—#1

IDENTIFICATION: L. 13½, T. 7½. The ani can hardly be confused with any other bird except possibly a male boat-tailed grackle. The huge curved horny ridge on the upper mandible gives it a unique and grotesque appearance. The two anis, however, are hard to tell apart except by note, the whining notes of this species being in sharp contrast to the soft double note of the groove-billed. Only in good light can the presence or absence of grooves in the ridge on the upper mandibles be noted, but in the smooth-billed this horny growth is much higher and more sharply curved. The only great difference in plumage is in the tips of the nape feathers, which in this species are bronze, in the next grayish. Young birds are sooty-brown, somewhat darker above than below.

HABITS: As this ani is abundant in the Bahamas, Cuba, and Jamaica, it is not surprising that it turns up occasionally in Florida. Normally the birds occur in loosely knit flocks of from one half to two dozen individuals. They like open, cultivated country and are most apt to be found near cattle, feeding like cowbirds or even sitting on the animal's back picking off ticks. The larger, less active insects on or

near the ground or stirred out of the soil by cattle are their chief food, but they also eat wild seeds and fruits.

VOICE: A slurred double note with a metallic quality and a rising inflection. Sometimes referred to as a whining whistle and likened to the call of a wood duck.

NEST: A large, bulky, rather flat structure 6 to 30 feet above the ground in dense vegetation. Where the bird is abundant a number of females generally use the same nest, depositing the eggs in layers separated by dead leaves. The females share the responsibility for their incubation, several often sitting at the same time. As the eggs in each layer hatch, the leaves are removed and the next layer is incubated. The eggs (1.40 x 1.05) are a glaucous blue or blue-green, covered with a thin chalky-white deposit that rubs off easily. As many as 20 eggs have been found in one nest separated into 4 or 5 layers, but it is not known how many eggs each female lays.

RANGE: (R.) South America from Paraguay north to Panama and through most of the West Indies to the Bahamas. It may occasionally turn up almost anywhere in Florida or along the Gulf Coast as far west as Louisiana.

Groove-billed Ani*

Crotophaga sulcirostris—#1

IDENTIFICATION: L. 12, T. $6\frac{3}{4}$. Stray anis encountered in any of the Gulf States might be this bird of the Rio Grande Valley or the smooth-billed of the Bahamas and West Indies. The smaller size of the groove-billed is no help in the field. Note differences under the preceding species. The bill distinguishes them from the boat-tailed grackle, the common long-tailed blackbird of the area, and their appearance in the air is distinctive, as their wings and tails seem to be loosely attached and coming askew.

HABITS: This ani occurs in both humid and arid areas if the country is open and has some brushy cover. Feeding habits appear to be the same as the smooth-billed's.

VOICE: Many varied, rather liquid soft notes. Alarmed, a double call with the first part short and high and the second lower, harsher, and prolonged, the whole repeated over and over.

NEST: A mass of dead twigs with a lining of fresh green leaves, usually 6 to 12 feet high in a shrub or tree which is often thorny. Nests are the work of from 1 to 3 pairs of anis. Each female contributes from 3 to 4 eggs ($1.24 \times .96$), pale blue with a chalky-white coating.

RANGE: (R.) Texas (Rio Grande Valley), s. Sonora, and Lower California south to Peru, Trinidad, and British Guiana.

Owls

Order STRIGIFORMES

BARN OWLS

Family TYTONIDAE

Barn Owl*

Tyto alba—#2

IDENTIFICATION: L. 18. The barn owl is relatively slim and notably long-legged. In flight it appears to have an enormous head, and the bird looks snow-white from below. It has the typical loose, deep wingbeat of an owl. The tone of the golden-brown upper parts varies but is generally slightly darker in the female.

HABITS: Open country, where it can locate small mammals as it flies overhead on silent wings, is its normal habitat. The bulk of its food is the most abundant rodent of the locality, varying from gophers, ground squirrels, and jack rabbits in the West to meadow mice and cotton rats in the East. As it frequents towns more than most owls, it takes numbers of house mice and Norway rats. It appears to have excellent hearing as well as eyesight. A series of squeaks will often draw it out of the night sky to hover over one's head for a few seconds.

In the fall most of these owls go south, although some remain north all winter. During the southward flight and in winter they become gregarious, with flocks of a dozen or more at favored roosts. When no suitable cavity or building is available for a roost they use dense evergreens.

VOICE: The commonest note in flight is a harsh hissing sound at widely spaced intervals. Around the nest it utters a

variety of weird notes. One is an unpleasant scream, another is like the cry of a nighthawk, another is an insect-like, rapid snapping noise made with the bill.

NEST: These owls will use almost any dark and sheltered place—cavities and hollows in trees, bird boxes, caves, barns, abandoned buildings and belfries, tunnels in banks, and burrows in the ground. Very rarely one nests in the open on the abandoned nest of some other large bird. No nest is built, but sites are often used year after year, and the ground becomes well carpeted with the broken pellets of fur and bone which an owl regurgitates after a meal. A clutch consists of from 5 to 11 pure white eggs (1.73×1.32). They are laid at all seasons of the year, but March to September are the usual dates. Now and then a pair will breed almost continuously the year round.

RANGE: (P.M.) The world. In North America south from Massachusetts, s. Ontario, Minnesota, and s. British Columbia.

TYPICAL OWLS

Family STRIGIDAE

Screech Owl*

Otus asio—#3

IDENTIFICATION: L. 10. In many areas this owl occurs in 2-color phases, one a rich rufous, the other almost solid gray. This difference bears no relation to age or sex, and an individual never changes. Rarely an intermediate brownish bird is encountered. The screech is our smallest "horned" or "eared" owl, a name which refers to the tufts of feathers on its head. It is also either the reddest or the grayest owl.

HABITS: The screech owl is a common bird of open woodlands and clearings, orchards and suburbs. It roosts during the day in the same type of cavity in which it nests, and comes out after dark. Its note is easily imitated, and the

bird will usually call back in answer to such an imitation even in broad daylight.

The downy young owls are snow-white, and adults are bold in defending them. In towns they have been known to knock the hats off passers-by on the sidewalk under the nest.

The screech owl eats almost any animal food. It catches night-flying beetles and moths and takes birds, frogs, crayfish, snails, reptiles, fish, bats and other small mammals, and even earthworms. Its diet depends largely upon what is most readily obtained.

VOICE: A low, tremulous whistle often rising at first, then falling. It has a plaintive, mournful quality and is sometimes described as a whinny.

NEST: The commonest site is an old woodpecker hole, but natural cavities are used and birdhouses are often accepted when the bottom is covered with sawdust. Sites vary from a few feet to 80 feet above the ground. Both birds often sleep in the nest during the day. The usual clutch is 4 or 5 white eggs (1.42 x 1.20).

RANGE: (R.) From New Brunswick, Ontario, s. Manitoba, s. British Columbia, and s.e. Alaska south to the Florida Keys, the Gulf Coast, and c. Mexico.

Great Horned Owl*

Bubo virginianus—#2

IDENTIFICATION: L. 18 to 25. This is our largest "eared" owl.

The sexes are alike except that the female is much larger than the male. In flight their wings seem long and broad, but the "ears" are held flat against the head. The dark under parts accentuate the white throat. In some regions these owls may be much lighter and in others much darker than the bird shown in the color plate. The Arctic race is sometimes as white as many snowy owls.

HABITS: The great horned owl is a truly magnificent wild creature, occurring almost everywhere from the deepest

forests to city parks where rats are abundant. On dark days it often hunts from midafternoon on. It eats every kind of animal life large enough to be worthy of its notice and small enough to handle, from beetles and scorpions to fish and snakes. Rabbits are its chief food, supplemented by other rodents. It takes birds of all sorts, including ducks, chickens, and grouse. It frequently eats skunks and has been known to take mink, opossums, domestic cats, red-tailed hawks, and barred owls.

One should be cautious in visiting an occupied nest. The birds do not hesitate to strike an intruder on the head or back, and the flight is so silent that one seldom has warning of the owl's approach.

VOICE: The calls vary, but the commonest and most characteristic one is a series of soft, deep *hoo* notes with considerable carrying power. In the distance it sounds like the baying of a dog, nearer like the *coo* of a dove. A distinctive series is *hoo hoo hoooo*, *hoo hoo*, lower and more uniform in pitch than the call of the barred owl with which it might be confused. Its scream, a loud, terrifying sound, is seldom heard.

NEST: They appear never to build a nest but to take over the nest of some other large bird. Those of red-tailed hawks, bald eagles, and herons are frequently used, but the owls also nest on protected ledges, in caves, and in hollow trees. In most areas they are the earliest nesters, the 2 or 3 white eggs (2.25 x 1.88) being laid in February even in New England.

RANGE: (R.) The Western Hemisphere from the northern limit of trees in the Arctic south to the Strait of Magellan.

Snowy Owl*

Nyctea scandiaca—#2

IDENTIFICATION: L. 25. Snowy owls vary in the amount of dark barring on their feathers, young being more heavily marked than adults, females than males. In flight their

heavy build, round head, and broad white wings are distinctive. The flight is jerky, as the upbeat of the wings is faster than the downstroke and is frequently interrupted by a short sail.

HABITS: This owl is fairly active all day and is distinctly a bird of open country. In the North it prefers rolling to flat tundra and spends much of its time on such lookouts as banks, boulders, or knolls. When it visits the United States in winter it is found in marshes, in dune areas, and on open farmland, where it perches on haystacks and buildings, seldom on trees. In the North lemmings, ptarmigan, fish, and hares are staple foods. The periodic epidemics that decimate the lemmings undoubtedly account for the great southward flights which occur on the average every fourth year. The snowy's abundance on its breeding grounds also varies from year to year with the rise and fall of the lemming population.

VOICE: A deep, vibrant, hoarse croaking suggestive of a raven's croak; also a shrill whistle.

NEST: On the ground thinly lined with moss and feathers; located on the higher, drier spots in rolling tundra. It lays 5 to 8 white eggs (2.25 x 1.79), which are incubated as soon as laid. The young bird from the first egg is often almost ready to fly before the last egg hatches.

RANGE: (P.M.) Arctic tundra of the world, south in winter to c. Asia, c. Europe, and n. United States. Heavy flights in certain winters have carried birds as far south as South Carolina, Georgia, Louisiana, Texas, and California.

Hawk Owl*

Surnia ulula—#3

IDENTIFICATION: L. 15, T. 7 $\frac{1}{4}$. Although a true owl, this bird looks more like a hawk and is fully active in the daytime. Its short, pointed wings and long wedge-shaped tail are distinctive.

HABITS: The hawk owl frequents the brushy openings and muskegs of the northern forests. Its food includes insects, rodents, and birds. It can handle weasels, hares, ptarmigan, and grouse. It is unusually fearless and has occasionally been caught by hand.

It spends much of its time perched on the top of a dead tree, where it may sit upright like an owl or with body inclined like a hawk, frequently lifting its long tail at an angle. When it flies it skims close to the ground, stopping now and then to perch for a few seconds on the top of a low bush. Its fast and graceful flight alternates with short glides. Close-to-the-ground hunting requires great maneuverability, and the hawk owl has a long rudderlike tail like the Accipiters that hunt the same way.

VOICE: A rather melodious whistle given as a rapid trill.

NEST: In cavities in the ends of broken tree stubs, old woodpecker or other natural holes in dead trees, rarely on a cliff or in the open stick nest of some other large bird. It lays 3 to 7 white eggs (1.60 x 1.27).

RANGE: (R.) The circumpolar coniferous forest of the Northern Hemisphere: in North America from Labrador, n. Quebec, Mackenzie, and Alaska south to s. Quebec, Ontario, n. Michigan, and c. British Columbia. Occasional great winter flights have carried it to New Jersey, w. New York, s. Ontario, s. Michigan, Montana, and Washington.

Ferruginous Pygmy Owl* *Glaucidium brasilianum*—#3

IDENTIFICATION: L. $6\frac{3}{4}$. This owl varies from ferruginous brown to olive brown. Its head is thickly marked with fine white streaks instead of dots as in the common pygmy owl of the western mountains. The tail is usually finely barred in two shades of reddish-brown. A distinct partly dark, partly light line separates the feathers of the neck from those of the upper back.

HABITS: Only in river-bottom forests have these birds been reported north of Mexico. This little owl is often active during the day, when it selects a conspicuous lookout in the top of a tree. It has a habit of cocking its tail at an angle, and when it gives its call it throws its head back. It feeds on mammals and birds and tackles prey of remarkable size.

VOICE: Variouslly described as a long series of rather deliberate *chu* or *cuck* notes.

NEST: In an old woodpecker hole or a natural tree cavity. The 3 or 4 eggs (1.14 x .93) are white.

RANGE: (R.) Extreme s. Texas and Arizona south to Chile, Argentina, and Uruguay.

Burrowing Owl*

Speotyto cunicularia—#3

IDENTIFICATION: L. 9. This little owl is always on or close to the ground. Its long legs and short tail are distinctive.

HABITS: During daylight it spends much of its time sitting near the entrance to its burrow, where it keeps turning its head through a full circle, scanning the sky and bowing frequently almost to the ground. This is a bird of open, treeless, short-grass country, usually occurring in loose colonies of 10 or 12 pairs in a 2- or 3-acre section. The owls seem to prefer abandoned animal burrows but are perfectly capable of digging their own. Their most active period is early evening and morning. Night-flying beetles and other insects are their most important food, but they take small rodents and an occasional bird, fish, frog, snake, or crayfish.

VOICE: The alarm note is a sharp, liquid *cack-cack-cack* . . . frequently uttered on the wing. The evening song is a long series of *cuckoo*-like notes, the second syllable drawn out to a hollow sound that carries well.

NEST: At the end of a 5- to 10-foot burrow, 1 to 3 feet underground. One or 2 sharp changes in direction are usually encountered before the nest cavity is reached at the far end. It is lined with broken pieces of horse or cow manure, grass, and roots. A normal clutch is 5 to 7 eggs (1.24 x 1.00). At the burrow entrance, which measures 5 x 3½ inches across, there is usually a mound of earth, and if the nest is active the opening is surrounded with bits of manure.

RANGE: (P.M.) C. Florida south through the West Indies and w. North America south from Manitoba and British Columbia and west from Minnesota, Iowa, Oklahoma, and rarely Louisiana. Also most of South America.

Barred Owl*

Strix varia—#2

IDENTIFICATION: L. 20. This big gray-brown owl with its short tail looks chunky. Its face has the curious appearance of being almost submerged in the collar formed by the barring of the feathers of the head, neck, and upper breast. In flight its wings seem short and rounded but broad. Its wingbeats are slow, but the flight is buoyant and graceful. The bird moves with surprising skill through dense forest. It is frequently active in the later part of the afternoon and may call almost any time of day.

HABITS: The barred owl is a bird of swamps and deep woodlands but hunts over adjacent open country. It is an abundant species through most of its range. It is notably curious. A few mouselike squeaks on the back of one's hand often causes it to materialize out of nowhere to perch over one's head and peer down with its dark brown eyes that are so unlike those of other owls.

This owl is mild by comparison with the great horned. Its feet are small and weak and it seldom tackles large prey. Mice form the bulk of its food, but it eats other small mammals, frogs, crayfish, fish, insects, and birds. It

apparently takes a good many smaller owls and undoubtedly takes any small bird it is lucky enough to catch.

VOICE: A series of 8 hoots on an even pitch in 2 groups of 4, the last part of the second group prolonged at a lower pitch. *Who cooks for you, who cooks for you-all?* approximates the cadence. The call is easy to imitate. If a barred owl is within hearing range an answer is usually forthcoming, and often the bird can be drawn to one. It makes other chuckling, grunting, and laughing sounds too varied to be described here.

NEST: This owl prefers hollows in trees and has been known to accept a "bird box." When a suitable tree cavity is not available it takes over the open stick nest of a large bird like a hawk or crow, or makes use of an old squirrel's nest, preferably in an evergreen tree. Telltale bits of long gray down fluttering from a shrub or branch often reveal the location of a nest. It lays 2 or 3 white eggs (1.93 x 1.65).

RANGE: (P.M.) East of the Rockies from Newfoundland, s. Quebec, n. Ontario, and n. Alberta south to Florida and the Gulf Coast through Mexico to Honduras.

Great Gray Owl*

Strix nebulosa—#2

IDENTIFICATION: L. 27. Although its body is about the size of that of a barred owl, this bird has such long loose plumage that it looks even bigger and heavier than a snowy or a great horned owl. Its tail is long and it has a wingspread of 5 feet or more. Its facial disks are large and sharply defined, and the head looks disproportionately massive. Its yellow eyes, gray color, and the vertical streaks up the breast to the throat distinguish it from the barred owl. It often allows a close approach, and when it moves off its flight seems heavy and labored.

HABITS: The great gray owl is seldom found far from dense timber. There it often hunts by daylight, although it seems

to prefer late afternoon and early evening. When winter flights bring it into the United States it may occur almost anywhere. The presence of the visitor is usually well publicized by crows. Crows have a knack for locating roosting owls and hawks, and one does well to investigate a mob of crows badgering something. Not much is known of the feeding habits of this species, but it appears to levy toll on all small mammals and probably on all small birds of the woodlands.

VOICE: Hooting sounds and tremulous whistled notes like a screech owl have been attributed to this owl.

NEST: It uses large bulky tree nests, but whether it builds them or takes over the nests of other birds is not known. It lays 2 to 5 white eggs (2.14 x 1.71).

RANGE: (R.) The circumpolar coniferous forest of the Northern Hemisphere from the northern limit of trees south; in North America to Quebec, n. Minnesota, n. Idaho, and c. California (mts.). Occasional winter flights occur (probably because of a failure of their normal food supply) which take them east and south to Massachusetts, Ohio, Nebraska, and Wyoming.

Long-eared Owl*

Asio otus—#2

IDENTIFICATION: L. 15. Long-eareds are our slimmest owls. They can compress their feathers and elongate themselves to look more like a broken tree branch than a bird. The long tail and the long "horns" add to the effect. The flight is buoyant but unsteady and mothlike.

HABITS: Timber in which to nest and roost seems to be the one requirement. In winter they are gregarious, and flocks of 5 or 6 to 25 occupy communal roosts. These are usually in a grove of dense evergreens.

In most areas these birds are more abundant than people realize. They are strictly nocturnal, seldom flush, and are too quiet to attract much attention. Few birds are

harder to find or study. Usually the best way to find this and other owls is to look under a stand of conifers for owl pellets. These cylindrical wads of tightly packed grayish fur and whitened bones are often conspicuous against the brown needles. They are the indigestible parts of an owl's meal, coughed up after the digestible material has been extracted. They are an infallible index to its food habits.

Only when a nest with young is located can one see long-eareds to advantage. Then the adults snap their bills, flutter on the ground in a broken-wing act, squeal, and even strike at the intruder. Most owls eat a good many mice, but this species eats little else. It hunts over both wooded and open country.

VOICE: This owl seldom makes a sound except during the breeding season. The commonest call is a soft cooing or series of mellow, low-pitched notes. When disturbed near the nest it utters a great variety of weird shrieks, whines, and mews.

NEST: An old nest, usually of a crow, squirrel, or magpie, preferably in an evergreen tree. The sitting bird usually does not flush, even when one goes directly under the nest, and is often invisible from the ground. Four or 5 white eggs (1.57 x 1.28) are laid.

RANGE: (P.M.) Temperate Zone of the Northern Hemisphere: in North America it breeds from Newfoundland, s. Quebec, n. Ontario, s. Mackenzie, and c. British Columbia south to Virginia, Arkansas, and n.w. Lower California; wintering from Massachusetts, c. Ontario, s. Michigan, s. South Dakota, and s. British Columbia south to Florida, the Gulf Coast, and c. Mexico.

Short-eared Owl*

Asio flammeus—#2

IDENTIFICATION: L. 15½. The short-eared is a fairly light-colored buffy owl with pale under parts more distinctly streaked and somewhat darker than those of the barn

owl. The "ears" are seldom visible. In flight the big round neckless head is easily noted. The wings show a dark patch on the underside and a pale one on the upper surface.

HABITS: This bird of open grasslands, marshes, and dunes hunts by day as well as by night. It rests and sleeps on the ground in a clump of vegetation, protected by its coloration. It is generally a good idea when walking across a marsh to clap one's hands as loudly as possible now and then to flush owls one would otherwise miss. In hunting this owl "hawks" back and forth with a loose deep wing-beat a few feet off the ground, dropping suddenly with feet forward when prey is sighted. At other times it sits on a post or similar vantage point waiting for some prey to reveal itself. It appears better able to catch mice than birds, and they constitute its chief food. Insects and birds are of secondary importance. These owls generally concentrate in greater abundance than any other avian predator in regions where a cyclic high in the mouse population has produced a "mouse plague."

In spring the male indulges in a spectacular aerial courtship in broad daylight. It ascends to a considerable height, uttering a repeated series of low-pitched *toots*. Finally it draws its wings together beneath its body and dives, clapping or rubbing them together to produce a fluttering sound.

VOICE: The short-eared is silent except during the breeding season, when it utters a variety of barking, squealing, and rasplike hissing notes.

NEST: On the ground, usually in a slight depression more or less lined grasses and placed, as a rule, in the shelter of a tall clump of grass or weeds. There are normally 5 to 7 white eggs (1.53 x 1.22).

RANGE: (P.M.) North and South America, Europe, and Asia. In North America it breeds from Baffin Island and Alaska south to New Jersey, Ohio, Kansas, Utah, and c. Cali-

fornia, and winters from Massachusetts, s. Ontario, Montana, and s. British Columbia south to Florida, the Gulf Coast, and Guatemala.

Boreal Owl*

Cryptoglaux funerea—#3

IDENTIFICATION: L. 10. This owl is about the size of a screech owl but lacks "horns." Its larger size, yellow bill, and the black outer part of its facial disks distinguish it from the saw-whet owl. Also, its head is spotted with white, not streaked, and it has a number of large round white spots on its back. The American race is known as Richardson's owl.

HABITS: Its home is in the conifer forests of the North, and little is known about it. It apparently eats mice, birds, and insects. When these owls periodically invade the United States they appear quite tame and have a tendency to seek shelter in buildings.

VOICE: Several calls have been described, but the commonest, which may be a courtship call, is like the sound of a soft high-pitched bell or of falling water.

NEST: In natural tree hollows or, most commonly, in the old nest of a flicker or pileated woodpecker. Farther north they often use open stick nests of other birds. The female lays 4 to 6 white eggs (1.27 x 1.06).

RANGE: (P.M.) Europe, Asia, and North America. It breeds from the northern limit of trees south to n. New England, s. Manitoba, and n. British Columbia. In winter they come south in numbers that vary from year to year, occasionally reaching n. New Jersey, Illinois, Colorado, and Oregon.

Saw-whet Owl*

Cryptoglaux acadica—#3

IDENTIFICATION: L. 8. This is much the smallest of Northern owls and is more likely to be encountered in the United States than the boreal owl. The young wear the distinctive

rich brown juvenile plumage most of the summer—longer than most birds.

HABITS: Saw-whets frequent dense woodlands, apparently preferring evergreen to deciduous trees and low, wet areas to dry woods. They hunt and roost close to the ground but are so completely nocturnal that they are not often seen. Even where they are common their presence is often unsuspected unless one listens for them during their early-spring courtship. They can be decoyed by a whistled imitation of their notes, and fully grown adults often allow themselves to be caught by hand.

VOICE: Silent except in late winter and early spring, when they become quite noisy. The calls are extremely varied. The best known, uttered in groups of three, sounds like the filing of a saw. Commoner is a monotonous and interminable series of whistled notes, closely spaced and rapidly uttered.

NEST: Old woodpeckers' holes, usually the flickers'. This owl is hard to flush from its nest, but pounding at the base of the tree will cause it to look out. Five to 6 white eggs (1.18 x 1.00) are a normal clutch.

RANGE: (P.M.) Breeds from Nova Scotia, Ontario, c. Alberta, and s.e. Alaska south to Connecticut, the mountains of Maryland, n. Indiana, Missouri, c. Arizona, and in the mountains of Guatemala. In winter, casually south to Virginia, Louisiana, and s. California.

Goatsuckers and Allies

Order CAPRIMULGIFORMES

GOATSUCKERS

Family CAPRIMULGIDAE

Chuck-will's-widow

Caprimulgus carolinensis—#6

IDENTIFICATION: L. 12. This, our largest goatsucker, seems chunkier than the whip-poor-will. The male differs from the female in having white on the ends of the outer tail feathers and in having a narrow, ill-defined white band across the lower throat. The smaller male whip-poor-will has the whole end of the outer tail feathers white and a much more prominent white throat band.

HABITS: This bird is abundant in southern rural districts where farming country is interspersed with patches of woodland. It is active only after dark. The day is spent crouching on or near a log, or on a horizontal limb or on the leaf litter of the forest floor. Its protective coloration makes it hard to see, as does its habit of always sitting parallel with the axis of a limb. Its food is chiefly beetles and moths, and an occasional small bird. A mouth with a gape of 2 inches plus the funnel made by a fringe of stiff bristles enables it to scoop prey out of the air. Most feeding is done on the wing close to the ground. The flight is silent and mothlike.

VOICE: The bird says *chuck, will's wid-ow* in 4 parts. The *chuck* is deep and low, the rest whistled loud and clear with the accent on *wid*. While hunting on the wing it utters a strange growl or croak. When calling steadily it pauses longer between sequences than the whip-poor-will-

NEST: No nest. The 2 eggs (1.40 x 1.00), cream-colored and blotched with different shades of brown underlaid with pale purple-gray markings, are placed on dead leaves or bare ground. Usually they are laid in a woods, frequently in such an open place that they are plainly visible unless covered by the female. If the eggs are molested the birds often move them in their bills to a new location.

RANGE: (M.) Breeds from s. Maryland, s. Illinois, and Kansas south to Florida, the Gulf Coast, and c. Texas. Winters from Cuba, the Bahamas, and Guatemala south to n. Colombia.

Whip-poor-will

Caprimulgus vociferus—#6

IDENTIFICATION: L. $9\frac{3}{4}$. The female lacks the broad white ends of the outer tail feathers which are so conspicuous in the male, and its throat band is buff instead of white. This species and the chuck-will's-widow differ from the night-hawk in having barred primaries, a fringe of bristles around the bill, and a rounded tail extending beyond the wing tips when the bird is perched. In flight the whip-poor-will's wings appear rounded and broad like an owl's. When the bird sails they are held out straight. To change direction a sailing bird tilts so sharply that its wings are sometimes almost vertical.

HABITS: Although common in rural country where ungrazed wood lots suitable for nesting are found, this bird is so nocturnal that it is known chiefly by its call. Its food is flying insects, and it goes through amazing gyrations in pursuing them.

VOICE: The 3-syllabled whistled call *whip-poor-will* differs from that of the preceding species in having the middle note weak, the first and especially the last accented. The preliminary *tuck* is seldom heard. The bird does not call on its wintering grounds.

NEST: Eggs are laid on the ground among dead leaves in partly open spots near the borders of predominately deciduous woodlands. The 2 white eggs (1.14 x .84) are scattered with gray blotches and often with brown specks.

RANGE: (M.) Breeds from Nova Scotia, s. Quebec, n. Michigan, s. Manitoba, and c. Saskatchewan south to e. Virginia, n.w. South Carolina, n. Alabama, n. Louisiana, and n.e. Texas; also in the mountains of s. Arizona and New Mexico to Honduras. Winters from lowlands of e.c. South Carolina and the Gulf States south to Costa Rica.

Poorwill*

Phalaenoptilus nuttalli—#6

IDENTIFICATION: L. $7\frac{1}{2}$. When perched, the poorwill's small size, pale gray-brown upper parts with sharp crossed black lines in the feathers, clear white throat, and tail feathers narrowly tipped with white are distinctive. In the air its shorter, more rounded wings lack the nighthawk's white spot, and its short tail shows only a little white at the end. In the female the white tail tips are narrower. Young have all markings less sharply defined and the throat buffy instead of white.

HABITS: Poorwills are typically birds of dry open country, where they spend the day on the ground under a clump of brush. In some areas they are found roosting on trees in the open forests of the lower mountains. The poorwill's flight is mothlike and erratic, and it generally hunts close to the ground. It eats flying insects, which it often watches for from an open spot on the ground and captures in a short sally into the air.

VOICE: A harsh and melancholy 3-note *poor-will'-ee*. At a distance the last note is lost and the call becomes soft and pleasant. In flight they have a clucking note.

NEST: The 2 faintly pinkish eggs (1.07 x .78) are laid on bare ground, rocks, or gravel near a tuft of grass or a low bush.

RANGE: (P.M.) Breeds from n.w. North Dakota and s.e. British Columbia south to c. Mexico and from w. Iowa, e. Kansas, and c. Texas west to the Pacific, w. Oregon, and e. Washington. Winters from s. Texas and s. California south to c. Mexico.

Pauraque

Nyctidromus albicollis—#6

IDENTIFICATION: L. 12. This bird has a broad white band across the base of the wing tips like a nighthawk, but its wings are heavier and shorter. Its long rounded tail with a narrow white streak down each side is also quite different. These white markings are much reduced in area and often heavily tinged with buff on the smaller female.

HABITS: Although permanent residents, the birds seem to disappear after the nesting season when they stop calling, and leave the more open nesting country for daytime roosts on the ground in river-bottom thickets.

VOICE: A soft, mellow, whistled *ko, whe-e-e-e-w*, which carries well. The first note is low, the second loud at the beginning and drawn out, with a rise in pitch at the end.

NEST: On bare level ground in fairly open places with a scattering of woody vegetation. The 2 eggs (1.17 x .88) are placed near the foot of a shrub. They are pinkish buff with small brown blotches.

RANGE: (R.) Southern half of the Texas coast and n. Mexico south to n. Argentina.

Common Nighthawk

Chordeiles minor—#6

IDENTIFICATION: L. 10. The sexes are much alike. Both have the distinctive white patch toward the ends of the long pointed wings. The female lacks the white band near the end of the tail, and its throat is buff instead of white. When perched, the tips of the closed wings reach beyond

the tail. This and the pale barred sides distinguish it from other eastern goatsuckers.

HABITS: During the day fence posts are good places to look for them, especially in the South. They may be active at any hour of the day or night, although their greatest activity is just before sunrise and after sunset. Thus, unlike the other more nocturnal goatsuckers, it is often seen in migration, when it travels in flocks, and during the long summer evenings. Since the advent of tarred and graveled roofs, this nighthawk has become common in towns and cities as these roofs seem to make ideal nest sites. During courtship immediately after arrival in the spring, the birds are noisy and conspicuous.

Their food is flying insects. Stomachs have been examined containing 50 different kinds; one contained 2,175 flying ants, another more than 500 mosquitoes. The birds do all their feeding on the wing, both high in the air and close to the ground.

VOICE: As it hunts in the sky it utters at intervals a loud, buzzy note with an insectlike quality which sounds like *pee-yah* or *spe-eak*. During courtship the male makes a loud, hollow, booming sound with its wings as it pulls out of a long fast dive.

NEST: The eggs are laid on open ground and a strong preference is shown for outcrops or barren gravel. The 2 eggs (1.17 x .86) are creamy-white to olive, speckled with slaty markings.

RANGE: (M.) Breeds from Newfoundland, Quebec, n. Ontario, n. Manitoba, and s. Yukon south to n. Mexico, the Gulf Coast, Florida, the Bahama Islands, and the Greater Antilles. Winters from Colombia to Argentina.

Trilling Nighthawk

Chordeiles acutipennis—#6

IDENTIFICATION: L. 9. The female differs from the male in having less white on the tail and a buffy instead of a white.

wing spot. The spot is nearer the tip of the wing on this bird which is smaller and browner than the common nighthawk.

HABITS: This bird is found in open country, where it feeds on the wing close to the ground, thus differing from the high-flying common nighthawk. It is a very graceful and silent flier. In cloudy weather it may hunt during the day but is most often seen at dusk or dawn. After dark it is reported to feed from the ground, and many kinds of beetles are included in the almost wholly insectivorous diet.

VOICE: The most distinctive call is a sustained rapid trill like that of a tree toad. It has several other calls—a soft cluck, a louder twanglike note, and a more varied and musical trill.

NEST: Under a small bush or on open bare ground. The 2 creamy-white eggs ($1.07 \times .77$) are peppered with fine grayish dots. They are paler and smaller than those of the common nighthawk and blend so well with the color of the ground that they are hard to find.

RANGE: (P.M.) Breeds from s. Texas, s. Utah, and c. California south to s.e. Brazil and s. Peru. In winter it is seldom found north of c. Mexico.

Swifts and Hummingbirds

Order MICROPODIFORMES

SWIFTS

Family MICROPODIDAE

Chimney Swift*

Chaetura pelagica—#12

IDENTIFICATION: L. $5\frac{1}{2}$. The swift's narrow, slightly curved wings and apparent lack of tail give it a distinctive appearance.

HABITS: It is a fast flier, but its extremely erratic course lacks the smooth gracefulness of swallow flight. It seldom perches outside its nesting or roosting chimney but flies and sails alternately, moving in circles, even when migrating. Photography has proved false the idea that the wings do not move in unison like those of other birds.

During migration the birds roost in large chimneys, to which they return year after year. Often thousands use a single chimney. A gathering flock as it swirls in circles over the chimney is a remarkable sight. Toward dark they begin dropping in, and the whole flock may disappear in a few minutes.

The bird's food consists of small flying insects which fill the air all summer in far greater abundance than we generally realize except on those rare occasions when a beam of sunlight against a shadowy background reveals their presence.

VOICE: A rapid and often almost continuous series of sharp chattering or twittering notes.

NEST: A shallow bracketlike cup of twigs cemented to the inside of a hollow tree or chimney. The nest twigs are

broken off with the feet while the bird is in flight. These are cemented together and the whole fastened to a vertical surface by a glutinous saliva from the bird's mouth. The 4 or 5 eggs (.79 x .52) are pure white.

RANGE: (M.) Breeds from Nova Scotia, s. Quebec, s. Manitoba, and e. Alberta south to Florida and the Gulf Coast and west to e. Texas and c. Montana. Winters in the Amazon basin of Brazil.

HUMMINGBIRDS

Family TROCHILIDAE

Ruby-throated Hummingbird

Archilochus colubris—#17

IDENTIFICATION: L. $3\frac{1}{2}$. This hummingbird should present no identification problem but must not be confused with the large hawk moths which also feed from flowers while in flight. Unless the sun catches the feathers of the male's throat at the right angle they appear black instead of red. The female lacks the bright throat but has white tips to its outer tail feathers which the male lacks.

HABITS: The ruby-throat is common wherever flowers occur. Its rapid wingbeat—55 to at least 75 times a second—together with its ability to turn its wing over and lead with the forewing on both the forward and backward strokes make it an avian helicopter—hovering, backing away, or moving forward at will. Its protein food consists of small insects. It also eats nectar, sap, and sugar water from artificial feeders.

VOICE: A jabber of forceful little high-pitched squeaks and squeals uttered in a nervous, excited fashion. In flight it makes a low buzzing noise with its wings.

NEST: A lichen-covered cup $1\frac{1}{2}$ inches in diameter, saddled on a small downward-sloping branch 10 to 20 feet above-ground, near or over running water in an open woodland.

It is made of bud scales and plant downs held together with spider silk. The 2 eggs (.51 x .33) are white.

RANGE: (M.) Breeds from Nova Scotia, s. Ontario, and s. Alberta south to Florida and the Gulf Coast and west to e. Texas, e. Kansas, and North Dakota. Winters from c. Florida and s. Louisiana south through Mexico to Panama.

Black-chinned Hummingbird

Archilochus alexandri—#17

IDENTIFICATION: L. $3\frac{3}{4}$. This close relative of the ruby-throat gets far enough east in migration for the two to occur in the same area in southeast Texas. In poor light, which makes the iridescent throat feathers of both species look black, the black-chinned's darker under parts and narrow white collar are diagnostic. Differences in the females are so slight as to make it impractical to try to separate them in the field.

HABITS: Areas with an abundance of bloom are often frequented by large numbers of these hummers. From lowlands, where maximum flowering comes early, they gradually work higher into mountains, where the blooming season is later. The black-chinneds' feeding habits are like the ruby-throats', but they also watch for small flying insects from a conspicuous perch and take them after the manner of a flycatcher.

VOICE: A soft, high-pitched, melodious warble and a louder, less musical chipping call.

NEST: A globular cup of plant downs bound together with spider web. Usually there are no lichens on the outside. It is saddled on a drooping branch over or near water some 4 to 10 feet above the ground. Two white eggs (.49 x .33) are usual, and 2 or 3 broods are raised.

RANGE: (M.) Breeds from w. Montana and s. British Columbia south to c. Texas, n. Mexico, and n. Lower California. Winters from n. Mexico south to Mexico City.

Rufous Hummingbird*Selasphorus rufus*—#17

IDENTIFICATION: L. $3\frac{1}{2}$. The rufous-brown male is unmistakable. Females and immatures can be distinguished from ruby-throats by the rufous color on the sides and in the rump area.

HABITS: This most northern of hummingbirds is abundant throughout its range. It seems able to adapt itself to any area where flowers capable of providing nectar and insects occur. It is especially attracted by red flowers. In recent years it has become known that a small eastward movement of this species occurs along the Gulf Coast in late fall and early winter.

VOICE: On the wing the male makes a characteristic rattling or vibrating sound, and both sexes have a low-toned double chirping note.

NEST: A $1\frac{1}{2}$ -inch-diameter cup made of vegetable downs bonded together with spider webs and decorated with bits of moss and lichen. A favorite site is the drooping lower limb of a conifer, but it may be high or low in a variety of places. Often a dozen or more pairs nest close together. A clutch is 2 white eggs (.52 x .35).

RANGE: (M.) Breeds from Alaska (to lat. 61°) east to s. Alberta and w. Montana, and south to e.c. California. In migration, east to e. Colorado, and occasionally the Gulf Coast to n. Florida. Winters chiefly in s. Mexico.

Buff-bellied Hummingbird**Amazilia yucatanensis*—#17

IDENTIFICATION: L. $4\frac{1}{2}$. There is no other bird in the United States with which this beautiful little red-billed hummer can be confused. Sexes are alike, and the brown tail, buff-brown under parts, and bright green throat make them

unlike the ruby-throats which pass through their range in migration.

HABITS: In the Rio Grande Valley this bird's home is the open woodlands and thicket edges, and it may become rare, as these are destroyed to make way for farms and orchards.

VOICE: Shrill twittering squeaks. It is quite noisy.

NEST: A cup $1\frac{3}{8}$ inches in diameter made of vegetable fibers bound together with spider webs and decorated outside with bits of dried bark, leaves, and lichen. Three to 8 feet off the ground in a shrub or small tree; saddled on a branch or placed in a fork. The 2 eggs (.52 x .34) are white.

RANGE: (P.M.) Breeds from the lower Rio Grande Valley of Texas through e. Mexico to Yucatan. In winter Rio Grande birds migrate south.

Kingfishers and Allies

Order CORACIIFORMES

KINGFISHERS

Family ALCEDINIDAE

Belted Kingfisher

Megaceryle alcyon—#11

IDENTIFICATION: L. 13. This is one of the few cases among birds where the female is more colorful than the male. She has the brown flanks and breastband. The kingfisher's blue-gray is unlike the intense blue of the blue jay, the only bird with which it could be confused. In flight it usually alternates a series of five or six wingbeats with a long glide. Except when traveling overland, it flies low, close to the water.

HABITS: Kingfishers are found wherever there is water, whether brook, pond, river, lake, or seacoast. They are solitary and seem unwilling to tolerate other kingfishers (except a mate in breeding season) on their waters. Within their territory they have regular perches, overlooking the water, between which they regularly patrol their domain. Their food is chiefly fish, but they seem able to obtain a variety of other items such as crayfish, shellfish, insects, and mice. They even eat wild fruit. The birds hunt by night as well as day. Their tendency to concentrate their feeding where heavy populations of small fish occur brings about a reduction which is usually desirable. Ordinarily more small fish are born than can be raised to maturity, so thinning is very necessary if any are to achieve a satisfactory rate of growth.

VOICE: A rapid series of loud, harsh notes often referred to as a rattle. The sound is like that of a heavy fishing reel. It carries remarkably well and has a vigorous, wild quality.

NEST: An enlarged chamber at the end of a burrow excavated by the birds in a bank steep enough to be relatively free of vegetation. The entrance is 3 to 4 inches in diameter, the upward-sloping burrow usually 4 or 5 feet long, the nest chamber about 4 inches in diameter. A bank near water is preferred but not essential. From 5 to 8 white eggs (1.33 x 1.05) are laid.

RANGE: (P.M.) Breeds from c. Labrador, Mackenzie, and n. Alaska south to c. Florida; the Gulf Coast to c. Texas, s. New Mexico, and s. California. Winters from s. New Jersey, Ohio, c. Missouri, Wyoming, and s.e. Alaska south through the West Indies and Mexico to British Guiana and Colombia.

Green Kingfisher

Chloroceryle americana—#10

IDENTIFICATION: L. 7½. This small white-spotted, dark glossy-green kingfisher is unmistakable. The male has a wide brown breastband. In its place the female has two lines of green spots.

HABITS: These birds usually watch for prey from a mid-stream boulder or a sand bar, where they sit jerking their tails up and down. They prefer quiet pools and backwaters of small clear-flowing streams. Many members of this family do no fishing at all, and often the green kingfisher is found miles from water, feeding on grasshoppers, butterflies, and lizards. These are caught in flycatcher-like sallies from a lookout perch.

VOICE: On the wing it utters a sharp insectlike rattle. Perched, it gives a low clicking note accompanied by a twitch of the tail.

NEST: In a cavity at the end of a burrow about 2 inches in diameter, extending back 2 or 3 feet in a sandy bank. The entrance is often near the top and hidden by vegetation or roots. The 4 to 6 eggs (.96 x .76) are white.

RANGE: (R.) S. Texas and s. Arizona south to c. Argentina.

Woodpeckers and Allies

Order PICIFORMES

WOODPECKERS

Family PICIDAE

Yellow-shafted Flicker

Colaptes auratus—#4

IDENTIFICATION: L. 13. Flickers are our only brownish woodpeckers and the only ones that commonly feed on the ground. They have the typical undulating flight of most woodpeckers. The white rump and the bright yellow under tail and wing surfaces show up when the bird is in the air. The male differs from the female in retaining the black patches on the sides of the throat, which both sexes have in juvenile plumage.

HABITS: This bird of fairly open country is common in rural areas that are well supplied with old orchards or wood lots and in suburbs. It is migratory in the northern part of its range, and the loose flocks of traveling birds are quite conspicuous; especially when concentrated near wide water barriers which they seem afraid to cross.

Ants are their most important food, and a single flicker stomach was once found to contain more than 5,000. It eats a variety of other insects and wild fruit. Sour-gum, dogwood, and poison-ivy berries are favorites.

VOICE: The flicker has many loud, distinctive calls. The commonest is a series of identical notes—*wicker, wicker, wicker*. It also makes a loud staccato drumming with its bill on a suitably resonant hollow limb, tin roof, or other object.

NEST: A cavity with an entrance hole $2\frac{3}{4}$ to 3 inches in diameter, excavated by both birds in a dead tree or branch a few feet to 90 feet above the ground. Old cavities, bird-houses, or hollow trees are often used. Locally certain trees are favored; e.g., apple, sycamore, or maple, and where trees are scarce telegraph poles or fence posts are used. Six to 8 white eggs ($1.06 \times .81$) are usual.

RANGE: (P.M.) Breeds east of the Rocky Mountains from the northern limit of trees in e. Alaska to Labrador and south to Florida and the Gulf Coast, west to Oklahoma, e. Wyoming, and British Columbia. Winters from Maine, s. Ontario, s. Michigan, and s.e. South Dakota south and west along the Gulf Coast to s.e. Texas.

Red-shafted Flicker

Colaptes cafer—#6

IDENTIFICATION: L. 13. This species can be separated from the yellow-shafted by the salmon-red instead of golden-yellow under wing and tail surfaces and the absence of red on the nape. Only the male has mustache marks in the adult plumage, and in this species they are red instead of black.

HABITS: The red-shafted and the yellow-shafted are so nearly identical in habits and interbreed so freely that it is questionable whether they should be regarded as distinct species. Formerly the Great Plains served as a geographical barrier to mixing, but extensive planting of trees and setting out of fence posts and public-utility poles have destroyed its effectiveness. Every possible blending of the distinctive characters of the two are known, and hybrids occur east to Pennsylvania.

Traces of red in the black throat stripes or a reddish tinge in the wings reveal red-shafted blood; black in the red stripes or traces of red on the back of the head reveal eastern flicker influence. Occasionally a curious bird is

produced in which the right half of the body is differently marked from the left.

VOICE: Same as yellow-shafted flicker.

NEST: Same as yellow-shafted flicker.

RANGE: (P.M.) Breeds from c. North Dakota, c. British Columbia, and s.e. Alaska east to w. Kansas, w. Texas, west to the Pacific, and south to s. Mexico. In winter, depending upon the severity of the weather, it withdraws from the most northern parts of its range and the higher mountains. It also commonly moves eastward in winter, often as far as Iowa, Arkansas, and e. Texas.

Pileated Woodpecker

Ceophloeus pileatus—#4

IDENTIFICATION: L. 17. Unmistakable. Both sexes have a red crest, but in the female it does not include the forehead and she lacks the red streaks along the sides of the throat. Young have the red crest even in the juvenile plumage.

HABITS: The pileated is a bird of extensive woodlands, although it will feed on the ground on stumps and down timber in woodland openings. It is so silent and so careful to keep out of sight that one seldom sees it. However, its feeding signs—holes 4, 5, or even 8 inches deep, roughly rectangular in shape—reveal its presence. Often these are only a few feet from the ground.

The birds know ant trees, even when they appear sound from the outside, and invariably cut directly into the center of the colony. These carpenter ants are their favorite food, but they take boring beetles in all stages from grubs to adults. Wild fruits and acorns seem to be their only vegetable foods.

VOICE: This is a very silent bird except in spring, when it calls and drums. It has a long call consisting of the same note repeated first with a rising, then with a falling inflection, a good deal like that of a flicker but louder,

deeper, and more full-throated. Other short and varied calls are exchanged continually by members of a breeding pair. Its resonant rolling drum which speeds up and fades away at the end is very distinctive.

NEST: A cavity with an entrance hole about $3\frac{1}{4} \times 3\frac{1}{2}$ inches cut in a dead tree or stub 15 to 70 feet aboveground in dense shade below the main canopy of the forest. The nest tree, which is generally 15 to 20 inches in diameter at the nest, is usually in a dense stand of trees in an extensive woodland. Four white eggs (1.30×1.00) are the normal clutch.

RANGE: (R.) From Nova Scotia, s.e. Quebec, s. Mackenzie, and British Columbia south to Florida, the Gulf Coast, and west to s.e. Texas. Absent from the s. Rocky Mountains and Great Basin but found from c. California north.

Red-bellied Woodpecker

Centurus carolinus—#4

IDENTIFICATION: L. $9\frac{1}{2}$. The finely striped "zebra" back and scarlet head make identification easy. Sexes are alike except that the red of the female's head is broken by gray on the crown into two patches, one on the nape and a smaller one at the nostrils. Even the young have scarlet heads. The reddish tinge on the belly is almost impossible to see in the field.

HABITS: Throughout the South this woodpecker is abundant in swamp- and bottom-land woods and frequent in most other woodlands. It comes into the outskirts of towns and around farms if a wood lot remains. Because of its racket one is seldom in doubt as to its presence. Its food is ants, beetles, and vegetable matter, including beech and acorn mast and corn as well as wild fruits.

VOICE: The red-bellied is a noisy bird. Its varied calls are of a soft, scolding character, somewhat lower in pitch than the flicker's. The commonest consists of a single *cherr* repeated in rapid succession from 2 to 12 or more times.

NEST: A cavity cut in a dead tree on the edge of a woodland opening. The entrance hole measures about $1\frac{3}{4}$ x 2 inches and is usually not more than 40 feet high. Soft-wooded trees are preferred, and both birds help with the cutting. Often they use the same hole more than one year. Occasionally they adopt the abandoned nest of some other species of woodpecker. A normal clutch is 4 or 5 dull white eggs (1.00 x .75).

RANGE: (R.) From Delaware, w. New York, s. Michigan, and s.e. Nebraska south to Florida and the Gulf Coast and west to e. Texas and e. Kansas.

Golden-fronted Woodpecker *Centurus aurifrons*—#4

IDENTIFICATION: L. $9\frac{1}{2}$. Three colors on the head where the red-bellied has one distinguish the male of this species. The female shows only two, as it lacks the red. The best field mark is the white rump, which shows up well in flight, along with the white patch in the wing. The golden front, like the red belly of the preceding species, is hard to see in the field.

HABITS: This bird has a special fondness for mesquite trees, but it is found in upland woods and river bottoms if there are large trees for nesting. Its food differs little from that of the red-bellied woodpecker.

VOICE: This noisy bird has a variety of harsh, scolding calls. They are distinctive but must be learned in the field, as some of them resemble notes of the flicker, red-bellied, and red-headed woodpeckers.

NEST: A hole from 6 to 25 feet high in living or dead trees, also in telegraph poles and fence posts. The bird lays 4 or 5 pure-white eggs (1.02 x .77).

RANGE: (R.) North and east in Texas to Dallas and Corpus Christi and west to Eagle Pass, south through Mexico to about Mexico City.

Red-headed Woodpecker*

Melanerpes erythrocephalus—#4

IDENTIFICATION: L. $9\frac{3}{4}$. An adult red-head is unmistakable, but the ashy-brown-headed juveniles are puzzling except in flight, when they show the white inner wing feathers characteristic of this species in all plumages. The juvenile plumage is worn into the fall.

HABITS: In summer they prefer open country and are often common in one area and inexplicably absent from similar habitats near by. When present they are conspicuous around farms, rural roads, and residential areas.

While the red-head does orthodox woodpecker feeding on grubs and other insects in dead wood, it obtains many flying insects. Watching from a conspicuous perch, it catches them in the air in sallies like a flycatcher's. When wild fruits begin to ripen it becomes vegetarian to a considerable degree. In winter it is more of a forest bird, and smaller acorns and beechnuts are staple foods.

VOICE: This noisy bird has a variety of indescribable scolding sounds, some harsh, some not unpleasant. One is like the crested flycatcher's scold; others are like the syllables *tchur-tchur* or *queer, queer, queer*.

NEST: A cavity from a few inches to 2 feet deep with a $1\frac{3}{4}$ -inch-diameter entrance hole cut in dead wood, most frequently in a tree but in some areas in a telephone pole or fence post. A normal clutch is 5 pure-white eggs ($1.00 \times .75$), and 2 broods are common.

RANGE: (P.M.) Breeds from s. New Brunswick, s. Quebec, s. Ontario, s. Manitoba, and s.e. Alberta south to Florida and the Gulf Coast and west to c. New Mexico, c. Colorado, and e. Wyoming. In winter it leaves that part of its range north of s.e. Pennsylvania, West Virginia, Tennessee, and Oklahoma.

Common Sapsucker*Sphyrapicus varius*—#5

IDENTIFICATION: L. $8\frac{1}{2}$. Adults of the eastern race are distinctive. The female is like the male except for her white throat. The dull-colored juveniles are best distinguished by the long white patch along the closed wing, a characteristic marking in all plumages. There are several western races with more red on the head. One, the red-breasted, has as much red as a red-headed woodpecker.

HABITS: In summer this is a forest or wood-lot bird which likes to be near water and small open spaces. It eats the nutritious inner bark of trees, making an extensive series of small, evenly spaced pits in doing so, and returning later to feed on the bleeding sap and the insects attracted by it. It does some fly-catching and enjoys fruit. Its brushlike tongue is not adapted to the normal type of woodpecker feeding.

VOICE: Many different, rather plaintive squeaks, mews, and whines, some of which sound cat- or squirrel-like. A common one is a downward-slurred *keeyew*. It is a loud drummer, hammering on resonant limbs, tin roofs, or wires with irregularly timed raps.

NEST: A cavity about a foot deep which the birds cut in a dead or dying tree, frequently a poplar or birch, near water. The normal $1\frac{1}{4}$ -inch opening is barely large enough to admit the parents. Five or 6 white eggs (.89 x .67) are the normal clutch.

RANGE: (M.) Breeds from Newfoundland, the south end of James Bay, n. Manitoba, s. Mackenzie, and s.e. Alaska south to New Hampshire, the Virginia mountains, n. Ohio, c. Missouri, New Mexico, and s. California. Winters from s. New Jersey, s. Ohio, Kansas, and s. British Columbia south to the West Indies and Central America.

Hairy Woodpecker

Dryobates villosus—#5

IDENTIFICATION: L. 9. Females lack the bright red spot on the nape. Young males are often pale reddish on top of the head but not on the nape. Neither the larger size nor the unbarred outer tail feathers are good field marks, but the proportionately much longer, heavier bill always serves to separate this woodpecker from the downy.

HABITS: The hairy is essentially a forest dweller, but in fall and winter many birds move into more open country and even come into towns and villages. Its most important food is the larvae of boring beetles, which it extracts from the tunnels in the wood with its extraordinarily extensible barb-tipped tongue.

VOICE: A loud, sharp, high-pitched, and emphatic single *peek* or group of separate notes. Also a rapid series of notes slurred into a rattle which drops in pitch as it progresses. Its "song" is a drumming made by striking a resonant dead tree with its bill. It is louder than a downy's but not so prolonged, although the intervals between raps are longer.

NEST: In holes cut by the birds in living or dead trees. The entrance is 2 inches in diameter and the cavity about a foot deep. The site is often in or near a swampy opening in the forest. They will occasionally use a bird box. Four white eggs (.94 x .72) are a normal clutch. One brood is raised.

RANGE: (R.) Newfoundland, Ontario, n. Manitoba, and s. Alaska south to the Bahamas and Panama.

Downy Woodpecker

Dryobates pubescens—#5

IDENTIFICATION: L. 6. The downy is in many ways a small edition of the hairy woodpecker. Except for the barred outer tail feathers, the plumage is similar and sex and age

differences are the same. The tiny conical bill is the only reliable field character.

HABITS: Downys are commonest in farm country with scattered trees and small wood lots. It is often a resident of towns and becomes very tame. The birds are fond of suet and will accept a loglike box with a handful of sawdust in the bottom both for nesting and for night roosting in winter.

The downy does much of its feeding in the bark of trees and in small dead branches. Its most important food is wood-boring ants, but it likes weevils and caterpillars. Much fall and winter feeding is in the dead canes of large non-woody plants, where it finds borers and gall insects.

VOICE: As it feeds it frequently utters a very abrupt *pik*. This carries well, although it is sharper and not as loud as the hairy's similar note. The downy utters the same sound as a staccato roll of a dozen or more notes, each distinct, but those at the end dropping in pitch.

NEST: A cavity 8 to 12 inches in a dead stub or branch which is often a part of an otherwise live tree. The entrance is about $1\frac{1}{4}$ inches in diameter, and the nest may be from a few feet to 60 or more feet above the ground. A normal clutch is 4 or 5 white eggs (.76 x .59).

RANGE: (R.) Newfoundland, Ontario, s. Manitoba, s.w. Mackenzie, and n.w. Alaska south to s. Florida, the Gulf Coast, s.c. Texas, s. New Mexico, and s. California.

Mexican Woodpecker

Dryobates scalaris—#6

IDENTIFICATION: L. $7\frac{1}{4}$. This little bird is the only woodpecker in its range with the back regularly barred with black and white. The female is like the male except for the top of the head, which is black where the male is red. Young birds are similar, but in juvenile plumage both sexes have some red in the crown.

HABITS: Throughout its range it is the common woodpecker of woodlands, mesquite thickets, and urban shade trees. In more arid areas it feeds in agave, yucca, cactus, and other desert vegetation. It feeds low, often on the ground. Besides the usual woodpecker diet of insects, it eats fruits of cactus and other wild plants.

VOICE: A shrill single or double note and a rapid series of ringing notes on a somewhat lower pitch.

NEST: A cavity in a decayed tree branch about 12 feet above-ground near water. When the branch slopes, as is often the case, the $1\frac{1}{2}$ -inch-diameter entrance is on the underside. The bird also nests in fence posts, telephone poles, agave, yucca, and cactus. A normal clutch is 4 or 5 white eggs (.81 x .62).

RANGE: (R.) The s.e. coast of Texas north to w. Oklahoma, s. Utah, and s. California and south to British Honduras.

Red-cockaded Woodpecker *Dryobates borealis*—#5

IDENTIFICATION: L. $8\frac{1}{4}$. Adults are black-capped, ladder-backed birds, but males have a small tuft of red feathers on either side of the black crown. Young birds are like adults, but their under parts are buffy instead of white, and the dark markings are sepia rather than black. The birds have more brightly colored heads in juvenile than in adult plumage, the center of the crown being crimson.

HABITS: This is the common woodpecker of open piny woods in the South. During the non-breeding season the birds travel in bands of six to ten and constantly call back and forth to one another. Several nesting pairs are generally found in fairly close proximity. When feeding, the birds fly restlessly from one tree to another, chasing each other and working the topmost pine branches, often upside down like nuthatches. Their food is chiefly wood-boring insects, but they occasionally visit cornfields and extract worms from ripening ears.

VOICE: This is a noisy bird with 2 rather different calls. One is short and nuthatch-like. The other, which is longer, is somewhat like the noise young songbirds make when the parent arrives with food.

NEST: A cavity 20 to 100 feet aboveground in a live pine with a rotten heart; used year after year as long as the bird can get resin to run from the nicks it makes in the bark around the nest hole. Where pine is not available it will use other trees. A clutch is normally 4 white eggs (.96 x .70).

RANGE: (R.) S.e. Virginia, Tennessee, s. Missouri, and n.e. Oklahoma south to s.e. Texas, the Gulf Coast, and Florida Keys.

Black-backed Woodpecker *Picoides arcticus*—#5

IDENTIFICATION: L. $9\frac{1}{2}$. The solid black back and the strongly barred flanks of this bird make it distinctive in any plumage. The female lacks the yellow fore crown of the male and has a black cap. Young birds are duller. Like the following species, this woodpecker has only three toes and is often called the Arctic three-toed woodpecker.

HABITS: Black-backed and three-toed woodpeckers live in the pine, spruce, fir, and larch forests of the North and are unsuspicious and fearless. They are found in greatest abundance where fire or lumbering has left dead or weakened trees or where beaver dams have flooded and killed extensive timber stands. Regular "colonies" often build up where the spruce budworm or the larch sawfly have opened stands to the inroads of flat-headed, bark-boring beetles—the bird's chief food. Most of their feeding is done by flaking off the bark rather than by working into old snags like most woodpeckers. Extensive trunk areas newly barked and still "bright" are typical feeding signs.

As dead trees soon lose their bark, such areas afford ideal feeding grounds for only a few years, and there are always likely to be many individuals seeking new feeding

grounds. These may wander considerable distances and become common in areas outside their normal range. This species as a rule comes farther south than the less abundant three-toed.

VOICE: The black-backed is much the noisier of the two yellow-headed woodpeckers. It has a sharp, short *clucking* note, a rattling call, and in flight a loud, shrill cry. In winter it is usually silent.

NEST: A cavity normally at no great height aboveground (2 to 15 feet) in a living or dead tree, usually near an opening in the forest. The entrance is $1\frac{1}{4}$ to 2 inches in diameter, the lower side often beveled in to form a "door-step" for the birds. A single brood is raised, and a clutch is ordinarily 4 white eggs (.84 x .75).

RANGE: (R.) Newfoundland, n. Quebec, n. Manitoba, n. Mackenzie, and c. Alaska south to New Hampshire, n. New York, n. Michigan, n. Minnesota, n.w. Wyoming, and c. California.

Three-toed Woodpecker

Picoides tridactylus—#5

IDENTIFICATION: L. $8\frac{3}{4}$. The most conspicuous difference between the three-toed and its larger relative, the black-backed, is its cross-barred black-and-white back. Young are similar to adults but duller. Both sexes show yellow on the head in juvenile plumage, the amount increasing in the male and disappearing in the female as adult plumage is acquired.

HABITS: This circumpolar species breeds farther north and, in our western mountains, farther south than its relative. It is rarely as common as the black-backed where the two occur together, nor is it as uniformly distributed through the coniferous forests which form the habitat of both species. It is seldom seen outside its normal breeding range or far from the deep woods.

VOICE: Like the black-backed's, but weaker and less sharp. It is a rather silent bird, less noisy even in drilling.

NEST: The 4 white eggs (.92 x .71) are deposited in a tree nest similar to that of the black-backed but with an entrance hole averaging about $\frac{1}{4}$ inch smaller.

RANGE: (R.) North to the limit of trees in North America, Europe, and Asia, south to n. New Hampshire, n. Michigan, n. Minnesota, and s.w. Oregon, and in the mountains to Arizona.

Ivory-billed Woodpecker *Campephilus principalis*—#4

IDENTIFICATION: L. 20. Sexes are similar except that the female lacks red in her crest. Since the abundant and widely distributed pileated woodpecker is frequently mistaken for this rare bird, great care should be used in verifying its identity. The big, conspicuous, creamy-white bill and the white lower halves of the folded wings are its most notable characters. In flight the rear half of the long inner wing is pure white.

HABITS: The ivory-bill's most important food is the larvae of wood-boring beetles, especially the flat-headed kind that work between the bark and wood of dying and newly dead trees. Their feeding sign is similar to that of the black-backed and three-toed woodpeckers—extensive trunk and branch areas from which the bark has been chipped to reveal bright wood beneath. As an ivory-bill will strip extensive areas of bark in a few feedings, it is most abundant where there has been an abnormal tree mortality because of fire, drought, wind, or insects. A normal healthy forest has a low carrying capacity for ivory-bills. It is likely that most nesting has always been in "die-off" areas, since only these seem capable of providing enough flat-headed borers to feed a pair of adults and their brood.

Destruction of the vast forests of the South, especially the luxuriant hardwood forests of the river bottoms, has

apparently doomed this splendid bird—largest of our woodpeckers. It is so rare that any record of one is noteworthy and should be passed on at once to the National Audubon Society, which is trying to save the bird from extinction.

VOICE: A high-pitched, nuthatch-like note, clear and musical but plaintive. The call note sounds like *kent*, by which name the bird is sometimes known. The birds are not especially noisy, and their calls do not carry far. They have a characteristic fast double rap, given at well-spaced intervals, which sounds like a single loud knock on a very hollow tree trunk.

NEST: A cavity well up in a large living or dead tree. The entrance hole is usually oval, averaging 6 or 7 inches high by 3 or 4 wide. The birds normally lay 3 white eggs (1.37 x .99).

RANGE: (R.) Formerly the South Atlantic and Gulf States from s.e. North Carolina to e. Texas and up the Mississippi Valley to s. Illinois and Ohio. Also Cuba.

Perching Birds

Order PASSERIFORMES

COTINGAS

Family COTINGIDAE

Rose-throated Becard

Platypsaris aglaiae—#10

IDENTIFICATION: L. $6\frac{1}{2}$. Juveniles look much like females. In immature plumage, in which they often breed, the throat of the male shows only a trace of pink, the full color taking two years to develop. The dark, bushy, erectile crown gives the bird a "big-headed" look, which is accented by the short tail. A light buffy collar is the female's most distinctive character.

HABITS: This bird prefers deep woods that are comparatively open below the tree crowns. Here it feeds in typical fly-catcher fashion, sitting quietly between forays on a lookout perch which is often inconspicuously located on a leafy branch. Its food is flying insects and wild fruits.

VOICE: A soft, plaintive whistle preceded by softer chattering notes. The whistle starts high and drops as the volume fades away.

NEST: A globular mass of fibrous material about a foot long and 9 inches in diameter, suspended from the drooping end of a branch 20 to 50 feet aboveground. The entrance is in the side, and a clutch is 5 brown-spotted white eggs (.91 x .67).

RANGE: (P.M.) From s. United States adjacent to Mexico south to Costa Rica. In winter there is some withdrawal southward from areas near the northern limit of the range.

TYRANT FLYCATCHERS

Family TYRANNIDAE

Eastern Kingbird*

Tyrannus tyrannus—#8

IDENTIFICATION: L. $8\frac{1}{2}$. The eastern kingbird's black tail with its white terminal band is its best field mark.

HABITS: Open country with perches from which it can watch for insects is this kingbird's habitat. It is sometimes found in wooded areas if an occasional tree rises high enough to furnish a lookout above the trees. Kingbirds are capable of rapid flight and a variety of aerial maneuvers, many of which are performed with such short, quick wingbeats that the bird's wings appear to quiver. It is always conspicuous and noisy and very aggressive toward any large bird invading its breeding territory. Flying insects caught on the wing are its staple food, supplemented by wild fruits.

VOICE: A single high-pitched strident note sometimes prolonged into a squeaky chatter. A common call is *tzi*, *tzee*. The true song, a rolling series of sharp notes followed by a phoebe-like ending, is seldom heard except in the half-darkness of predawn.

NEST: A rather loose mass of sticks, straws, and other material lined with a well-constructed inner cup of fine grass, roots, and hair. Outside diameter about $5\frac{1}{2}$ inches. Normally placed 20 to 25 feet up on the horizontal limb of a tree growing in the open. The bird favors the vicinity of water and will nest on low shrubs, stumps, and fence posts. It lays 3 or 4 creamy-white eggs (.95 x .70) irregularly speckled and spotted with brown and underlying blotches of gray.

RANGE: (M.) Breeds from New Brunswick, s. Ontario, c. Manitoba, and s.w. British Columbia south to s. Florida, the Gulf Coast, Texas, n. New Mexico, n. Utah, and w. Ore-

gon. Winters from Costa Rica east to British Guiana and south through w. Brazil to s. Bolivia and Peru.

Gray Kingbird*

Tyrannus dominicensis—#8

IDENTIFICATION: L. 9. This large pale gray kingbird with its oversize bill, solid gray square tail, and dark ear coverts is unmistakable.

HABITS: The vicinity of the seacoast is the normal home, and it matters little whether the area is a wild stretch of mangrove or a busy town. Most of the time the bird stays on a conspicuous perch, watching for insects or intruders. Telephone wires seem to be preferred. Territorial defense, which in most birds is enforced only against intruding males of their own kind, is extended in this pugnacious species to all manner of larger birds and mammals, including man. Insects and wild fruits are its only known foods.

VOICE: This bird is seldom quiet. It constantly utters a loud, shrill, 3-note chatter—*pe-cheer-y*—with the accent on the middle note. A loud snapping noise made with the bill is common.

NEST: A flimsy structure of coarse twigs lined with grasses, placed in a thicket, preferably of red mangrove, 3 to 20 feet high and often over salt water. The 3 pinkish eggs (.99 x .72) are well blotched with brown.

RANGE: (P.M.) Breeds from s.e. South Carolina and w. Florida south along the coast through the West Indies, and the coast of Central America to Venezuela and Colombia. In winter absent from that part of its range lying northwest of Hispaniola, the birds apparently migrating to n. South America.

Olive-backed Kingbird*

Tyrannus melancholicus—#8

IDENTIFICATION: L. 8½. There are a number of gray-headed kingbirds with yellow under parts. The distinguishing

characters of this species are its slightly forked brown tail without white and its brilliant yellow under parts. The olive-green back is variable, as the green feathers bleach out and become gray by spring.

HABITS: This wide-ranging bird seems able to adapt itself to any open or semiopen country. Agricultural areas with scattered trees are well suited to it. Occasionally it is found around forest openings and river and lake borders.

VOICE: Rapid, metallic, staccato notes in an ascending high-pitched series.

NEST: A Texas nest was described as 6 inches in diameter, made of Spanish moss and twigs and lined with fine rootlets and hairlike material. It was 20 feet aboveground on a small lateral tree branch. A normal clutch is 3 or 4 creamy-pink eggs (.98 x .73) with small brown spots.

RANGE: (P.M.) Breeds from s. Texas and s. Arizona south to Argentina. Withdraws in winter from the extreme northern part of its range.

Western Kingbird*

Tyrannus verticalis—#8

IDENTIFICATION: L. 9. Its white outer tail feathers are the best field mark. In young birds colors are duller, and sometimes white is lacking in the tail. Absence of wing bars and brown on the wings and tail separates it from the crested flycatchers.

HABITS: This is a bird of open country. It is common around ranch buildings and comes into towns. It avoids woodlands but wanders over treeless country if fences or telephone wires are available. The opening up of the once heavily forested East is making it possible for this and other western birds to extend their breeding range eastward.

The western has most of the typical kingbird characteristics but is more tolerant of its own kind than the eastern bird. Often a tree has more than one nest and

several pairs may occupy a small grove. Grasshoppers form an important part of the food supply, which is almost wholly insect.

VOICE: A variety of high-pitched squeaks, chatters, and twitters a little less shrill than those of the eastern kingbird.

NEST: All sorts of fibrous and soft materials are intermixed to build a nest about 6 inches in diameter with a 3-inch inner cup well padded with wool and downs; located almost anywhere if trees are not available. In trees it is usually 15 to 30 feet up on a horizontal limb. The 4 eggs (.93 x .70) are like those of the eastern kingbird.

RANGE: (M.) Breeds from s. British Columbia and s. Manitoba east to Michigan, Missouri, and Oklahoma and south to n. Texas and n. Mexico. Winters from n.w. Mexico south along the Pacific side to El Salvador. During fall migration occurs regularly in small numbers on the Atlantic coast.

Scissor-tailed Flycatcher *Muscivora forficata*—#10

IDENTIFICATION: L. 14, T. 9. Sexes are similar, but the female can usually be distinguished by her smaller size, shorter tail, and somewhat less vivid and extensive underwing color. The even duller brownish-backed young birds lack the patch of orange-red where the underwing joins the body.

HABITS: Scissor-tails are birds of open country, where scattered trees provide lookout perches. They often sit on roadside fence wires, oblivious of passing cars. They are kingbird-like in habits and are great harriers of larger birds. Their long tail gives them a maneuverability in the air which they seem to enjoy showing off. During courtship in the spring the male engages in wonderful sky dances. Even at other seasons it frequently executes a series of vertical zigzags while rapidly opening and closing its deeply forked tail, chattering all the while. Although they catch most of their food on the wing, the birds eat few flies. Grasshoppers, crickets, and beetles are their chief food, and they

occasionally go to the ground for them. Little non-insect food is taken.

VOICE: Kingbird-like twittering notes; also a harsh double-noted call repeated in rapid succession.

NEST: Placed about 15 feet high in an isolated tree or man-made structure; bulky and roughly built out of soft and fibrous material. The 5 creamy eggs (.89 x .67) are spotted with brown.

RANGE: (M.) Breeds from s. Nebraska, w. Arkansas, and e. Texas south to s. Texas and west to s.e. New Mexico and w. Oklahoma. Winters from s. Texas south to Panama.

Kiskadee Flycatcher*

Pitangus sulphuratus—#10

IDENTIFICATION: L. 10½. This large heavy flycatcher with intense yellow under parts and rufous wings and tail is unmistakable. Young birds are slightly duller and lack the yellow crown patch.

HABITS: This wide-ranging species is usually common along water courses lined with dense vegetation, but it also frequents agricultural country and is often abundant in towns. It uses conspicuous perches when hunting food, much of which consists of large flying insects. Fruit is relished at certain seasons. Its most interesting habit is its fishing. Perched over water like a kingfisher, it dives after fish near the surface, but the dive is not as deep and clean-cut as the kingfisher's. After about 3 sorties its plumage requires drying in the sun before diving can be continued.

VOICE: A variety of loud 2- or 3-note calls given rather slowly and deliberately. When the bird is excited they are speeded up to a shrill chatter.

NEST: A bulky 14-x-10-inch structure of mixed fibrous and soft material with the entrance in the side; about 20 feet high, preferably in a thorny tree. The 4 creamy-white eggs

(1.15 x .82) are sparingly spotted with brown around the large end.

RANGE: (R.) From the lower Rio Grande Valley south to Argentina.

Crested Flycatcher*

Myiarchus crinitus—#8

IDENTIFICATION: L. 9. The cinnamon wings and tail are the best field marks. Young differ from adults only in duller coloring. These noisy birds are more often heard than seen.

HABITS: This is essentially a woodland bird. It prefers open mature forests but is found around openings in denser second growth. Adaptable to some degree, it frequently lives in old orchards and around buildings and shade trees in farm country. During the breeding season each pair defends a large territory against other crested flycatchers, and the nest tree is usually a dangerous place for any larger bird. Leafy tops of taller trees provide concealed lookout perches, and the bird does much of its feeding in the forest canopy. Insects of many kinds furnish the bulk of its food, augmented in fall by wild fruits.

VOICE: A loud, clear, whistled *wheeeep*, often followed by a few raucous scold notes. The calls are varied, and some are much like those of a red-headed woodpecker.

NEST: In a cavity, preferably natural, not more than 6 to 15 feet high, in an old tree or branch; also in woodpecker holes and bird boxes. If too deep the cavity is filled with trash to within 12 to 18 inches of the opening. The nest is of any convenient material—feathers, rags, string, hair, grass, roots, and fibers. Recently shed snakeskins, wax paper, cellophane, and onionskins are often included. The 5 or 6 eggs (.89 x .68) are creamy-white with brown spots and erratic wavy lines.

RANGE: (M.) Breeds from New Brunswick, s. Ontario, and s.e. Manitoba south to s. Florida, the Gulf Coast, and e.

Texas and west to c. Kansas and e. South Dakota. Winters from s. Texas and s. Florida to Colombia.

Mexican Flycatcher*

Myiarchus tyrannulus—#8

IDENTIFICATION: L. $9\frac{1}{2}$. The crested flycatcher has some 16 close relatives in Mexico and Central America. This grayer-backed bird is a slightly larger and much paler edition of the crested, with a wholly dark bill and browner head.

HABITS: This bird frequents heavy timber, but where giant cacti full of woodpecker holes are present for nest sites it occurs in treeless country.

VOICE: Loud and harsh, the commonest sound being a short double call accented on the second note. It also has a loud, clear, whistled call that is not unmusical.

NEST: In natural cavities or woodpecker holes in trees, fence posts, and giant cacti, placed 5 to 30 feet aboveground; a mass of vegetable fibers, feathers, and hair. The 3 to 5 eggs (.95 x .72) are creamy-buff, like those of the crested flycatcher, but less heavily marked.

RANGE: (R.) From s. Texas, c. Arizona, and s. California south to El Salvador.

Ash-throated Flycatcher*

Myiarchus cinerascens—#9

IDENTIFICATION: L. $8\frac{1}{4}$. This bird is noticeably smaller than the two preceding species, and its back is clear gray-brown with a little trace of olive. Its black bill is similar to that of the Mexican but much smaller, and its throat is nearly white.

HABITS: This is a bird of dry bush or cactus country. It does most of its foraging in low vegetation, seldom fly-catching from a fixed perch but ranging over a large territory. Some

insects are caught in the air; others, like caterpillars, are picked from leaves.

VOICE: Like that of the crested flycatcher; a clear, whistled note, a harsher *che-hoo*, and some soft, mellow whistles.

NEST: In natural cavities seldom over 20 feet aboveground. When such sites are absent the birds use the abandoned ovenlike nests of cactus wrens and all sorts of cavities in man-made structures. The 4 or 5 creamy-white eggs (.88 x .65) are more lightly marked than those of the Mexican flycatcher.

RANGE: (P.M.) Breeds from c. Washington, n. Utah, and w.c. Texas south and west through n. Mexico to the Pacific. Found in winter from s. Arizona south to Costa Rica.

Eastern Phoebe*

Sayornis phoebe—#9

IDENTIFICATION: L. 7. The black bill and the lack of an eye ring or distinct wing bars (except in juvenile plumage separate this from other flycatchers. Its best field character is its habit of constantly waving its tail with a sideways as well as an up-and-down motion.

HABITS: This, our hardiest flycatcher, comes north early and stays late. An occasional bird stays north of the normal wintering ground all winter. In wild areas the phoebe usually stays near running water, probably because natural nest sites are plentiful along steep-sided streams. It has responded favorably to civilization and is common in the country near buildings of all sorts. Flying insects are the chief food, and their abundance around barnyards make these especially favorable nesting places.

VOICE: The phoebe says its name over and over in a low, forceful voice. The delivery is emphatic and the tone has a rough aspirate quality. The bird also has a few shorter and longer calls.

NEST: Originally phoebes nested on rock shelves or in cavities on the walls of steep-sided ravines, but now they nest extensively on man-made structures. All they require is overhead shelter and a reasonably flat projecting surface to which the nest can be attached. Bridge girders, rafters in open buildings, window sills, and shutter tops near the eaves are popular. The nest is a $4\frac{1}{2}$ -inch cup of mud and moss with a lining of grass and hair. The 5 eggs (.75 x .55) are pure white. Two broods are normal, 3 rare.

RANGE: (M.) Breeds from Nova Scotia, s. Ontario, c. Manitoba, and c.w. Mackenzie south to s.e. Virginia, n. Georgia, Arkansas, and e.c. New Mexico. In Kansas and the Dakotas seldom ranges west of the one hundredth meridian. Winters from about the southern limit of its breeding range south to s. Florida, the Gulf Coast, and s. Mexico.

Say's Phoebe*

Sayornis saya—#9

IDENTIFICATION: L. $7\frac{1}{2}$. Even juveniles have the rusty-brown under parts that make this species unmistakable.

HABITS: This phoebe frequents dry country with stunted vegetation and is seldom found in forested areas or on rich land. When feeding it flits over low growths with a strong, somewhat erratic flight. From low perches it watches for insects in the air or on the ground. It is a hardy species and an early migrant. When its insect supply fails it turns to wild fruits.

VOICE: A soft, plaintive 2-note call like *phoe-eur*. Also a more rapid 3-note call and occasionally a trill.

NEST: Site preferences are virtually the same as those of its eastern relative; a flat soft nest of plant fibers, grasses, wool, and hair. Four to 5 white eggs (.77 x .60) are a normal clutch, and it raises 2, rarely 3, broods a season.

RANGE: (M.) Breeds from s. Manitoba, n. Alberta, and c. Alaska south to n. Mexico and from s.w. Yukon, e. Wash-

ington, and e. California east to c. North Dakota, w. Iowa, and w. Oklahoma. Winters from c. Texas and c. California south to s. Mexico.

Yellow-bellied Flycatcher* *Empidonax flaviventris*—#9

IDENTIFICATION: L. $5\frac{1}{2}$. During migration it is generally impossible to identify any of the *Empidonax* flycatchers in the field unless the bird gives its distinctive call. Of the four species, this one, because of its coloring, might constitute an exception. At all seasons it is much yellower below than the others and is the only one with a really yellow throat.

HABITS: In summer these flycatchers live in damp, sphagnum-carpeted northern forests of spruce, tamarack, paper birch, and fir. Dense alder swamps are the best place to look for them in migration, but their habit of perching and feeding close to the ground makes them hard to see. Often only their soft, plaintive *peas* reveal their presence.

Small insects that can be caught on the wing are the standard food of all little flycatchers. When unseasonable cold weather keeps insects from flying they can survive for a few days on berries.

VOICE: Its common call is a soft, mournful 2-note whistle, the second note rising and slightly prolonged, the whole like an abbreviated wood pewee song. The bird also utters an abrupt song that sounds like a sneeze.

NEST: On or near the ground in the side of a mossy mound or in the roots of a fallen tree. A rather bulky cup of moss and rootlets lined with hairlike roots and grass. The 3 or 4 dull white eggs (.68 x .53) are sparingly dotted with brown.

RANGE: (M.) Breeds from Newfoundland, c. Quebec, c. Manitoba, and s. Mackenzie south to s. New Hampshire, n. Pennsylvania, s. Wisconsin, and c. Alberta. Winters from n. Mexico to Panama. Migrates east of the Plains.

Acadian Flycatcher**Empidonax virescens*—#9

IDENTIFICATION: L. $5\frac{3}{4}$. Their small size, conspicuous eye ring, and double wing bars set the *Empidonaxes* apart from other flycatchers. The head and back of the Acadian are greener and often lighter than those of any other *Empidonax* but the yellow-bellied, but in the absence of direct comparison this is not of much use for field identification.

HABITS: The summer home is in the deep shade of dense and fairly mature woodlands. Beech stands are favorites. It feeds in the open area beneath the foliage canopy, watching for flying insects from a dead twig, where it sits motionless except for a quick tail jerk every time it utters its distinctive note.

VOICE: Its call is a short *peet*, its so-called song an abrupt *ka-reep*, with the accent on the higher-pitched and longer second note, which has a rough quality. In flight it sometimes utters musical twittering notes.

NEST: A woven basket of plant stems and other fibrous material suspended between horizontal twigs at a fork near the end of a tree branch. The birds are reported to use spider and insect silk in construction, and though fragile-looking the nests are durable. Ten feet aboveground is an average height, and they are often over a stream. The 3 white to buffy eggs (.72 x .54) are sparingly dotted with brown chiefly at the large end.

RANGE: (M.) Breeds from s. Vermont, n. New York, s. Ontario, s. Michigan, and e. Nebraska south to c. Florida, the Gulf Coast, and s. Texas. Winters in e. Colombia and e. Ecuador.

Alder Flycatcher**Empidonax traillii*—#9

IDENTIFICATION: L. 6. Although it is larger and much browner than the Acadian and has the whitest throat of the whole

group, one cannot surely separate this species from the Acadian except by habitat and voice.

HABITS: This is ordinarily a bird of shrubby thickets in swampy areas where alder, willow, and swamp rose thrive. Alders of the Midwest nest differently and have a different song (a sneezy 2-note *fitz-bew*) and are found in dry upland pastures thickly overgrown with hawthorn and other shrubs as well as in orchards, suburbs, and roadside growths. If the separation of birds into species were not so exclusively based upon differences in the appearance of their skins, the alder flycatchers of the Mississippi drainage might be regarded as a separate species.

Alder flycatchers sing and fly-catch from conspicuous perches on tall shrubs.

VOICE: The alarm note is an abrupt *wit*. A common song is composed of 3 forceful syllables, the first short, the second accented and slurred off to the third, which is in a lower pitch—like an emphatic *way-be-o*. Other similar but shorter or longer calls are easily recognizable.

NEST: Usually about 2 to 4 feet from the ground in the upright fork of a swamp shrub, occasionally in a fern clump. It is suspended above the crotch and not set down in it like that of a least flycatcher. The $3\frac{1}{2}$ - to 4-inch nest is loosely woven, with many hanging ends. It is generally of grasses, weed stems, and bark, lined with a well-constructed cup of fine grass and fiber. The birds in the Midwest that nest away from swamps saddle their nests on horizontal limbs as high as 20 feet from the ground. The 3 or 4 creamy-white eggs (.70 x .52) usually have a few fine brown dots.

RANGE: (M.) Breeds from e.c. Labrador, n. Ontario, Mackenzie, and c. Alaska south to n. New Jersey, West Virginia, s. Illinois, c. Texas, and n. Mexico. Winters from s. Mexico to Venezuela and Ecuador.

Least Flycatcher**Empidonax minimus*—#9

IDENTIFICATION: L. $5\frac{1}{4}$. This bird is grayer on the back, whiter below, and smaller than other *Empidonaxes* and is the only one with a fairly dark lower mandible. These are poor field marks and superfluous in spring, when it repeatedly calls its common name—*chebec*.

HABITS: This flycatcher is less specific in habitat requirements than other members of the genus and as a result is widely distributed. Open country well scattered with trees is ideal, and it is usually abundant around orchards, gardens, towns, parks, and rural country. It becomes scarce in really deep woods.

VOICE: The least's song is an emphatic *chebec* strongly accented on the higher second note. The bird is the noisiest of its group, since it utters this sound almost constantly during spring and early summer. Each repetition is accompanied by a toss of the head and flick of the tail. Its call is a single short *whit*.

NEST: A rather deep thin-walled cup about $2\frac{3}{4}$ inches across, made of bark fibers, weed stems, and a variety of soft substances, lined with fine grasses, hair, down, and feathers. About 6 to 15 feet aboveground is a normal height. The nest is always firmly wedged in a crotch. The 4 creamy-white eggs (.63 x .51) are unmarked.

RANGE: (M.) Breeds from Nova Scotia, Ontario, n. Alberta, and w.c. Mackenzie south to n. New Jersey, s.w. North Carolina, Indiana, and s.w. Missouri west to s.e. Wyoming and e. British Columbia. Winters from n.e. Mexico to Panama.

Eastern Pewee**Myiochanes virens*—#9

IDENTIFICATION: L. $6\frac{1}{2}$. Indistinct wing bars, a yellowish lower mandible, long wings, and a short tail which it does

not wag separate the pewee from the phoebe. Its large size, the absence of an eye ring, and the pale line down the center of the breast separate it from the *Empidonax* flycatchers.

HABITS: The pewee inhabits the mid-level in tree growths and readily accepts any area that is reasonably supplied with large trees, from deep woods to old orchards and town plantings. A lookout perch well up in a tree is used in feeding, and the bird commonly returns to it following each sally after a passing insect.

VOICE: The pewee's song is given for about $\frac{3}{4}$ of an hour after the first sign of daybreak and again in the late evening. It is composed of slurred 2- and 3-note phrases—*pee-wee*, *pe-ab-weet*, and an unslurred *hi-de-dee*—continuously delivered in a regular pattern. The tone is a clear, sweet, plaintive whistle. During the day the slurred phrases and a chip note are uttered at intervals while the bird feeds.

NEST: A thick-walled shallow cup saddled on a horizontal limb about 20 feet high, generally so well covered with lichens as to be almost invisible from below. Weed stems, bark shreds, and other fibers are used, and the nest is lined with plant downs, wool, etc. Three creamy-white eggs (.72 x .54) wreathed at the larger end with blotches and specks of brown.

RANGE: (M.) Breeds from Nova Scotia, s. Ontario, and s. Manitoba south to Florida, the Gulf Coast, and s. Texas and west to c. Oklahoma, e. Kansas, and e. North Dakota. Winters from Costa Rica to Colombia and Peru.

Western Pewee*

Myiobanes richardsoni—#9

IDENTIFICATION: L. $6\frac{1}{2}$. The grayer upper parts, the more extensive and more deeply olive-gray under parts, the darker throat, and darker lower mandible of this species are of doubtful value in separating the two pewees in the

field. On the other hand, their notes are quite distinct. The western's harsh, rasping slur, not unlike the call of a nighthawk, is in sharp contrast to the clear sweet whistles of the eastern.

HABITS: The 2 pewees are much alike in habits. This bird, however, accepts more open areas than the eastern and frequently avoids the denser woodlands.

VOICE: The song is a rising 3-note phrase delivered in a clear whistle and accented on the first note, alternating with a harsh, buzzy downward slur unlike any note of the eastern pewee. The bird is often quiet by day but may sing into the night.

NEST: Differs from that of the eastern in lacking the outer covering of lichens. Also, it is larger and deeper and often has feathers in the lining. The location is generally the same, and the eggs of the 2 species are undistinguishable.

RANGE: (M.) Breeds from s. Manitoba, s. Mackenzie, and c. Alaska south through Mexico and east to e. Manitoba, w. Nebraska, and w. Texas. Winters from s. Mexico to Bolivia. In migration reaches the s. Texas coast.

Olive-sided Flycatcher*

Nuttallornis borealis—#8

IDENTIFICATION: L. $7\frac{1}{2}$. A large-billed, heavy-headed, dark flycatcher sitting upright on the topmost twig of a dead tree is likely to be this bird. The dark flanks contrast strongly with the otherwise white under parts, and often a tuft of long silky white feathers can be observed on either side of the lower back just above the tail.

HABITS: The edge of an opening in a coniferous forest is the best place to look for this species. It likes small ponds, bogs, and burns with a few dead trees for lookouts. As it is aggressive in defense of its territory, breeding pairs are well separated. The olive-sided feeds heavily on the ant-wasp-bee group of insects.

VOICE: The calls of this noisy bird carry a long way (some say up to a mile) and are uttered frequently all day. *Quick three beers* is an interpretation of one, the *quick* shorter and weaker than the other 2 notes, the *beers* long and slurred downward. Its 1- and 2-note calls are delivered in the same loud, emphatic scream.

NEST: At varying heights but generally well up in a conifer near the end of a horizontal limb where twigs or cones offer support. The foundation is loosely woven of coarse twigs, and the top and cup are finished off with usnea lichen, moss, rootlets, and grasses. The 3 pale cream to buffy-pink eggs (.85 x .63) have a ring of scattered brown spots around the larger end.

RANGE: (M.) Breeds from Newfoundland, Ontario, n. Saskatchewan, and c. Alaska south to w. North Carolina, n. Wisconsin, c. Arizona, and n. Lower California. Winters from Colombia to Peru.

Vermilion Flycatcher

Pyrocephalus rubinus—#10

IDENTIFICATION: L. 6. The adult male, except in one of its 2 rare color phases in which the under parts are yellow-orange or deep wine-purple, is unmistakable. The female is salmon-pink or at least yellow in the belly region but, unlike the similar Say's phoebe, has streaked under parts, light gray lores, and a whitish forehead. Young birds have scaled backs, round spots below, and only a trace of yellow on the belly.

HABITS: Stream- and river-bottom willows, cottonwoods, and shrubs are its usual habitat. Roadside plantings, shade trees, and isolated tree clumps some distance from water are occasionally occupied. It feeds in the typical flycatcher manner, but at no great height aboveground. Its lookout perch is usually a weed stalk or shrub, and it often takes insects from the ground.

VOICE: Its common calls are 2- or 3-note phrases given in a loud, energetic whistle, accompanied by an upward jerk of the head. It also has a beautiful soft twittering or tinkling flight song which is part of the courtship performance. This is delivered at intervals while the bird hovers in the air on rapidly fluttering wings.

NEST: Set into a horizontal fork well out from the trunk and ordinarily about 10 to 20 feet from ground near running water. The flat nest is made of fine and fibrous materials, including feathers, bound together with spider webs. Frequently the outside is decorated with lichens. The 3 creamy-white eggs (.69 x .51) are heavily marked with brown at the larger end.

RANGE: (P.M.) Breeds from s. Texas, s. Utah, and s. California south to c. Argentina. In early fall most individuals breeding in the United States migrate into Mexico, but a few move northwest to the Pacific Coast and northeast along the Gulf Coast as far as n. Florida.

Beardless Flycatcher*

Camptostoma imberbe—#9

IDENTIFICATION: L. $4\frac{1}{2}$. This nondescript little bird may behave like the flycatcher it is, but often it feeds like a warbler or vireo. It is no bird for the beginner to try to identify unless it is heard as well as seen. Sometimes old birds have a decided crest of sooty feathers. Young birds are brown above with cinnamon wing bars.

HABITS: The beardless flycatcher inhabits large trees and forest growths, dense second growth, and in south Texas seems partial to the low bushes of the chaparral and the mesquite thickets. Although an insect eater, there are times when it feeds heavily on small wild fruits.

VOICE: The loud song of the male, delivered from the top of the tallest tree, consists of 3 long slow notes followed by a trill. The call is a shrill but not unmusical series of 4 or 5 short notes on a descending scale, loudest in the middle.

NEST: A globular mass of plant fibers with a downward-sloping entrance on the side; center cavity padded with plant downs or fur. The nest may be at any height in a tree or shrub where the bird can find supporting material such as a clump of mistletoe or Spanish moss. The 3 white eggs (.65 x .48) are finely speckled with brown.

RANGE: (P.M.) Breeds from s. Texas and s. Arizona south to Costa Rica. Withdraws from the United States in winter.

LARKS

Family ALAUDIDAE

Horned Lark

Otocoris alpestris—#17

IDENTIFICATION: L. $7\frac{3}{4}$. Head and chest markings of female and young are less vividly black than the male's, and they lack the male's black forehead. Horned larks from different areas vary in the color of the throat, forehead, and eyeline. In the common race of the eastern Arctic these are bright primrose-yellow, while in the race that breeds in eastern United States they are practically white. The best field characters are the habit of walking rather than hopping (see water pipit) and the black tail that contrasts so sharply with the white under parts when the bird is seen from below in flight.

HABITS: The more barren and unattractive an area, the better it seems to suit the horned lark. As soon as cover develops, even weeds and tall grass, the birds desert it. Every breeding pair seems to require some bare exposed earth within its territory. Lumbering, plowing, soil impoverishment, and overgrazing have enabled this species to expand its range and increase its numbers. In winter the birds gather in flocks that may number thousands, but their habitat preference seems the same. In summer they feed on insects, but throughout the year seeds of grasses and weeds form their staple foods.

VOICE: In winter as the birds flush and fly off they utter 1- to 3-note calls. These are high-pitched, sibilant, and more prolonged than a pipit's, the most distinctive being a double note, one part higher in pitch than the other. The song which the bird starts very early in spring is a rapid series of high 1- and 2-note phrases varying in pitch to produce a weak, wiry twittering.

NEST: In the open on bare ground in a slight depression or near a stone or clod, the outer cup of grasses, the inner of plant downs or hair and feathers. Four eggs (.85 x .62) are normal, their gray or greenish background color often obscured by a thick sprinkling of fine brown specks. In some areas the birds habitually nest so early that the first eggs are destroyed by snowstorms one year in every three.

RANGE: (P.M.) Breeds from the coasts of the Arctic Ocean south to n. South America, n. Africa, and s. Asia. In winter retires from its northerly range, wintering from New Brunswick, s. Ontario, n. Minnesota, and s. British Columbia south. In eastern North America rarely gets south to the Gulf States.

SWALLOWS

Family HIRUNDINIDAE

Bahama Swallow

Callichelidon cyaneoviridis—#13

IDENTIFICATION: L. 6. This bird's outstanding character is its deeply forked (about 1 inch) long tail and dull velvety green head and back. Females are smaller and duller with a sooty wash behind the eye and on the sides of the breast and center of chest. Young birds are brownish above with a green luster and have a touch of sooty on the sides of the breast.

HABITS: Not much is known about these swallows, but they seem to be either somewhat migratory or great wanderers. There would probably be more Florida records if

observers on the southeast coast and keys kept watch for them.

VOICE: A low, musical, chirping note.

NEST: In old woodpecker holes or natural cavities or under the eaves of buildings.

RANGE: (R.) Occurs throughout the Bahamas from Grand Bahama to Great Inagua and on the northern coast of Cuba.

Tree Swallow*

Iridoprocne bicolor—#13

IDENTIFICATION: L. 6. Adults are unmistakable. Young can be confused with the browner-backed bank and rough-winged swallows but are whiter below, and the grayish chest band is fainter and narrower than that of the bank swallow in any plumage.

HABITS: A small body of water, a marsh, or a wet meadow are an essential part of their habitat as the birds do most of their feeding as they skim low over such areas. Their rapid wingbeat and slightly flickering flight are distinctive. When they sail, as they frequently do, it is with shoulders forward and wing tips down. Aggregations in late summer and fall may number thousands. The birds make quite a spectacle as they sit shoulder to shoulder on wires or festoon bushes and trees and overflow to the ground. This hardy swallow is an early spring migrant, turning to berries (especially bayberries) and seeds when cold weather makes flying insects scarce.

VOICE: Varied twitterings of a sweet, liquid quality, often run together into a rippling chatter.

NEST: Their wild nest site is a natural cavity in a tree or one cut by woodpeckers, but they readily accept man-made structures. A nest site in open sunlight near water or a wet meadow is preferred. Loose colonies often occur where a beaver dam has created a body of water filled with dead tree trunks. Colonies of more than 100 pairs have been

established artificially in many areas by putting up individual nest boxes on scattered poles. Such colonies have proved effective in reducing crop-eating insects, which the birds catch during the adult flying stage before they have laid eggs. This easy, cheap, and virtually automatic form of insect control continues year after year once the easily constructed nest boxes are up. Four to 6 white eggs (.74 x .52) are normal, and 2 broods are raised. The nest cavity is lined with grasses and the inner cup is made of feathers.

RANGE: (M.) Breeds from Newfoundland, n. Manitoba, MacKenzie, and n. Alaska south to Maryland, c. Missouri, Colorado, and s.w. California. Winters from North Carolina and the Gulf Coast, n. Mexico, and s. California south through Cuba to Guatemala.

Bank Swallow*

Riparia riparia—#13

IDENTIFICATION: L. $5\frac{1}{4}$. This bird with its brownish head and back and darker wings and tail is not easily confused with any other species except the larger rough-winged. When perched, the bank's dark chest band settles the matter, but as this is not easily seen in flight, the clear white throat is the better field mark. Young birds are like adults except that much of their plumage is washed with light reddish-brown.

HABITS: The highly specialized nest-site requirements of this cosmopolitan bird appear to control its distribution and abundance. Natural sandy banks seldom remain sufficiently steep unless the base is being constantly cut away by wave action or water currents. Since man started digging gravel pits and railroad and highway cuts the birds have made increasing use of them.

When feeding, these swallows generally fly low, with a fluttery and erratic motion as they twist and turn at full speed. When sailing, they tend to hold their wings close to the body. Their food is wholly insectivorous.

VOICE: Irregularly alternating clear high-pitched and lower notes with a slight vibrating quality, run together into a chatter or twitter.

NEST: A loose cup of grasses lined with feathers in a cavity at the end of a 2- or 3-foot burrow which the birds dig near the top of a steep-faced sand or gravel bank. The birds nest in colonies from a dozen to more than 100 pairs. The burrow entrances measure about 1 inch high by 2 inches wide and are often only a few inches apart. Usually more burrows are started than finished, and many birds eventually nest in burrows of previous years. Four or 5 white eggs (.70 x .50) are a normal clutch, and 2 broods are common.

RANGE: (M.) Breeds in the whole Northern Hemisphere. In North America from n. Labrador, Mackenzie, and n. Alaska south to s. Virginia, c. Alabama, s. Texas, and s. California. American birds winter chiefly in Brazil.

Rough-winged Swallow* *Stelgidopteryx ruficollis*—#13

IDENTIFICATION: L. $5\frac{3}{4}$. Adult rough-wings are larger and browner than bank swallows, with back, wings, and tail the same color and throat and forward under parts uniformly gray. Young are similar but lighter, with light brown edgings on their feathers, and should not be confused with young tree swallows.

HABITS: Nest sites seem to be the sole factor controlling the bird's distribution, and it has benefited even more than the bank swallow from human activities. It is not averse either to wet or arid country, so long as a sandy bank is available. All feeding is done coursing low over ground or water. A powerful flier, this swallow's wingbeats are deeper but slower than a bank's, and its motion is more in a straight line, with fewer twists and turns and more gliding and sailing.

VOICE: A rasping, short single or double note, harsher and lower than the bank swallow's.

NEST: These solitary nesters use a variety of locations—ends of burrows in steep-faced sandy banks or cuts, crevices in rock ledges, drainpipes, and crevices about bridges or buildings. The 6 or 7 eggs (.72 x .52) are laid in a loose mass of grass and other plant debris.

RANGE: (P.M.) Breeds from New Hampshire, n. Michigan, North Dakota, and c. British Columbia south to s. Brazil. In winter it is not found north of n. Mexico.

Barn Swallow

Hirundo rustica—#12

IDENTIFICATION: L. 7. Unmistakable. Females and young are like males but somewhat duller.

HABITS: The barn swallow is a powerful flier and ends each wingbeat with the primaries pointing almost straight back. Unlike most land birds, it migrates by day. It follows coast lines and rivers and, like many eastern birds, reaches South America by way of the West Indian island chain to Trinidad. The shooting of the migrants as they course low over the water off beaches is unfortunately still considered great sport on such islands as Barbados.

VOICE: A series of energetic, bubbling, twittery notes at different pitches; liquid, distinctive, and not unmelodious.

NEST: The nest of mud bonded with grass is lined with soft grasses and feathers and plastered against a vertical or horizontal surface. Against the former it is the shape of a truncated half cone; against the latter it is a circular cup. Originally these birds nested in caves or in crevices and niches under overhanging rocky cliffs, and some still do. But, having discovered better protection from the weather in man-made structures, they have adopted them so widely as to become a much more abundant species. Since they greatly reduce flying insects around barnyards, every farm

building should have one or two small openings to let them in to nest. Nesting birds may be solitary or in colonies of 50 to 60 pairs in a building. The 4 or 5 white eggs (.74 x .53) are variably marked with reddish-brown spots or dots; 2 broods are raised.

RANGE: (M.) Breeds throughout the Northern Hemisphere and winters mainly in the Southern. In the Western Hemisphere breeds from s. Labrador, Ontario, s. Manitoba, n. Mackenzie, and n.w. Alaska south to North Carolina, n.w. Alabama, Arkansas, and c. Mexico. Winters from Colombia and British Guiana south to c. Argentina.

Cliff Swallow*

Petrochelidon pyrrhonota—#13

IDENTIFICATION: L. 6. The pale reddish rump and almost square tail set the adults apart from other swallows. The forehead varies from creamy-white to pale brown or even darker in the cliff swallows of the Southwest and Mexico. Young birds are similar to adults but duller and less strongly marked.

HABITS: Like all swallows, the cliff wants open country over which to feed. Its distribution is puzzling, as it is abundant in some areas while in other apparently similar areas only a few scattered colonies are present. This bird has the longest migration route of any American land bird. Its return north in the spring follows a fairly rigid schedule, not to the day and hour, as is absurdly claimed for the San Juan Capistrano birds, but generally within two or three days of a given date. Occasionally they are decimated by late cold spells during which they starve to death because insects are not flying. Their food is wholly insect, including numbers of such crop destroyers as weevils and chinch bugs.

VOICE: An incessant chatter of husky creaking notes.

NEST: Generally a retort-shaped vessel of mud with a narrow protruding neck on the side as an entrance. Sometimes an

open cup like the barn swallow's. Cliff swallows are gregarious, some colonies numbering thousands. Originally and to some extent still cliff dwellers, they have increased and spread into cliffless areas by nesting on buildings, under the eaves. They can easily be encouraged by nailing a narrow strip of wood just below the eaves to provide support for the nests, which the birds find hard to cement to painted wood. In some cases a mud supply must also be provided. The 4 or 5 eggs (.80 x .55) are creamy to pinkish-white, variously spotted with brown.

RANGE: (M.) Breeds from Nova Scotia, n. Ontario, n. Mackenzie, and n. Alaska south to c. Virginia, n. Alabama, Missouri, and Guatemala. Winters from s. Brazil south to c. Argentina.

Cave Swallow*

Petrochelidon fulva—#13

IDENTIFICATION: L. $5\frac{1}{2}$. The pale reddish-brown throat without a black patch, the dark brown forehead, darker rump, and broad white streaking on the back readily separate this species from the cliff swallow.

HABITS: Still apparently dependent upon natural nest sites, this swallow is uncommon in south Texas, although possibly no more so than the barn and cliff swallows were before they began to nest on man-made structures. Its accidental occurrence on one of the Florida Keys with migrating swallows in early spring suggests that it may be to some extent migratory.

NEST: In caves or under overhanging cliffs; a bracketlike mud cup attached to the wall or built into a crevice. The nest, unlike the cliff swallow's, is well lined with grass, roots, and feathers. Occasionally nests are found in abandoned buildings. The 4 eggs (.77 x .55) are like the cliff swallow's.

RANGE: (M.) Breeds from s.c. Texas south to s. Mexico and on all the Greater Antilles. Range at other seasons unknown.

Purple Martin

Progne subis—#12

IDENTIFICATION: L. 8. Females and young differ from males in their duller blue backs with patches of dark gray and their gray under parts, which become lighter toward the belly. In flight these martins continuously alternate between flapping and sailing. Their broad-based triangular wings are distinctive.

HABITS: Martins may nest in any good agricultural country if boxes are provided, but there are puzzling gaps in their distribution, and many seemingly ideally situated boxes stay unoccupied year after year. In many sections they have become the most domestic of wild birds. Through community interest in putting up boxes some towns have become famous for their martin population. In some cases thriving colonies have been established on the busiest street in town. In fall the birds form enormous temporary roosts before leaving for South America; when these are in village shade trees the martins become less popular for a few weeks. Flying insects and a few from the ground are the martin's food. Some observers have noted a great appetite for eggshells.

VOICE: A rich low-pitched chirruping composed of liquid gurgling notes of varying pitch. This is often given in flight and serves to identify birds passing overhead.

NEST: Originally in holes and cavities in trees, cliffs, and among loose rocks. The early settlers found the Indians putting gourds on a tall pole for the martins and copied them. Today most nesting is in artificial sites, the birds occupying anything from the simplest single-room box to elaborate 200-compartment houses, provided they are in the open and up on a 15- or 20-foot pole. The nest is a loose heap of grass and other debris piled into the cavity. A normal clutch is 4 or 5 dead-white eggs (.96 x .69).

RANGE: (M.) Breeds from Prince Edward Island, Quebec, Ontario, s. Manitoba, c. Alberta, and s. British Columbia south through the West Indies to Tobago and c. Mexico. Winters in the Amazon Valley of Brazil.

Gray-breasted Martin

Progne chalybea—#12

IDENTIFICATION: L. 7. Both sexes look much like a female purple martin. An old male has upper parts of a dark steel blue which occasionally extends to the sides of the breast, but most young males and all females are dark sooty-gray above, faintly washed with blue. The best field marks for this species are the dark forehead and the clear white unstreaked belly, which is in sharp contrast to the gray breast. In the female purple martin the forehead is heavily speckled with pale gray and the under parts are well streaked with narrow dark gray lines that run through the centers of the gray breast feathers. Also the feathers of the lower breast lighten gradually and merge imperceptibly with the pale gray or dirty white of the belly instead of contrasting sharply.

HABITS: Human settlements seem to provide ideal habitats. During the breeding season the birds are found in towns and cities and near isolated rural dwellings. Later they appear to wander through more or less open country.

VOICE: A rather pleasant low twittering or warbling.

NEST: In the wild they probably nest like purple martins, but now that they are abundant in cities and towns most nesting is in rafters of open buildings, under eaves, and in bird boxes. The 3 to 5 eggs (.87 x .60) are white.

RANGE: (R.) Occurs from n. Mexico (probably s. Texas) south all over Central and South America to n. Argentina.

JAYS and CROWS

Family CORVIDAE

Canada Jay*

Perisoreus canadensis—#7

IDENTIFICATION: L. $11\frac{1}{2}$. This soft gray fluffy jay with its small bill looks very much like an oversized chickadee. Although the head pattern is variable, adults are unmistakable. Juveniles are a uniform sooty color, darkest above, becoming almost black about the head.

HABITS: Throughout its range the Canada jay is found almost exclusively in coniferous forests. As a scavenger it is much attracted by human activities, and from woodland camps it takes off and caches not only food but any small items that take its eye. This "camp robber" eats almost everything from baked beans (a special delicacy) to insects, seeds, fruits, and buds.

VOICE: The calls are varied. Most are pleasant and unjaylike, but a frequent one is a weak complaining or querulous cry. Another is a single clear whistle. The rallying cry is a loud *ka-whee* or *ka-we-ah*.

NEST: A bulky compact structure of twigs, bark strips, and much soft material, placed near the trunk and rather low (4 to 30 feet) in a dense conifer, occasionally in a willow. The center cup is thickly lined with fur, feathers, and similar material to help keep the eggs warm. This species often lays in February, when temperatures may be below zero. The usual clutch is 4 grayish eggs ($1.12 \times .80$) evenly marked with dots and spots of olive-brown.

RANGE: (R.) Occurs from the northern limit of trees in Labrador, c. Quebec, n. Mackenzie, and n. Alaska south to Nova Scotia, New Hampshire, n. New York, c. Michigan, s.w. South Dakota, n. New Mexico, and n. California. In winter sometimes wanders as far south as Pennsylvania and Nebraska.

Blue Jay**Cyanocitta cristata*—#7

IDENTIFICATION: L. $11\frac{3}{4}$. Young do not differ appreciably from their parents.

HABITS: The big, noisy blue jay is one of the most colorful of the wild birds that have responded favorably to civilization and become common in the shade trees of eastern towns, but it is essentially a woodland creature and is still most abundant in open oak and beech forests. After breeding, jays gather in flocks that do much to enliven the fall woods with their calls and flashes of blue.

The blue jay is about three quarters vegetarian—acorns, beechnuts, and corn being its staple foods. During summer its diet becomes preponderantly insectivorous. Jays bury more acorns and beechnuts than they can eat and are therefore important agents in planting oak and beech forests.

VOICE: Extremely varied: harsh calls, a trumpeting whistle, a scream like a red-shouldered hawk, a flicker-like call, and a song of soft warbles and twitters.

NEST: In a tree crotch or on branches near the main trunk up about 10 or 15 feet; made of sticks with grass and other softer material at the center to form a cup. The 4 to 6 buff to greenish eggs ($1.10 \times .80$) are spotted with brown, most heavily at the large end.

RANGE: (P.M.) Occurs from Newfoundland, Quebec, n. Manitoba, and s. Alberta south to Florida and the Gulf Coast, west to c. Texas and e. Colorado. There is a marked north-south movement, but some birds remain in all parts of the range throughout the year.

Scrub Jay**Aphelocoma coerulescens*—#7

IDENTIFICATION: L. $11\frac{1}{2}$. Scrub jays are long slender birds with long expressive tails. The gray back, light throat, and

dark breastband are distinctive. Young birds are patterned like adults, except that blue is replaced by shades of gray and brownish-gray. The Florida race is smaller and duller with a darker throat.

HABITS: These noisy birds are often hard to see as they are never far from dense brush or scrub. In the West they occur in a variety of habitats from stream-bottom willow thickets to dry mountainside woodlands mixed with chaparral. In the piñon country they are found in juniper thickets and live largely on pine nuts. These jays do much of their feeding on the ground but disappear into brush at the first sign of danger.

The range of the Florida race, formerly regarded as a distinct species (Florida jay), is separated by more than 1,000 miles from the range of the nearest western race, a curious situation paralleled by the Florida burrowing owl, Florida sandhill crane, and Audubon's caracara, except that all the latter species also occur in Cuba, where the scrub jay is unknown.

VOICE: Their calls are varied, but most are distinctive. The commonest are emphatic and abrupt 1- or 2-note calls uttered in a loud, harsh voice. Some are much like those of a boat-tailed grackle. Their song of soft, musical notes and trills is seldom heard.

NEST: A fairly bulky structure composed of sticks and lined with rootlets; placed in a dense bush or small tree from 2 to 12 feet from the ground. The normal clutch is 4 buffy to greenish eggs (1.05 x .80) with dark brown or greenish-brown spots.

RANGE: (R.) Occurs in the Florida peninsula and from s. Wyoming and s. Washington south to s. Mexico and from w. Nebraska and c. Texas west to the Pacific.

Green Jay**Xanthoura yncas*—#7

IDENTIFICATION: L. 11½. Both sexes wear the same plumage, and young birds are similar but paler.

HABITS: This is a bird of dry thickets and forests with dense undergrowth. Like most jays, these are found in small flocks outside the breeding season, when they often wander into more open country around towns and ranches. Green jays have the family curiosity that prompts all jays to gather for a look when any unusual visitor invades their territory. A lone jay is often furtive, but backed by companions, it becomes bold and fearless. Green jays feed on insects, seeds, and fruits, and are very fond of corn.

VOICE: Their calls vary from harsh screams to more musical whistles. They are noisy birds and make their presence known by their calls.

NEST: Five to 15 feet from the ground in a bush or small tree in a thicket; a typical jay nest loosely made of thorny twigs and lined with fine rootlets. Four grayish eggs (1.05 x .80) thickly spotted with brown are the normal clutch.

RANGE: (R.) Occurs from the lower Rio Grande Valley of Texas and Jalisco south to Peru and Venezuela.

Black-billed Magpie**Pica pica*—#7

IDENTIFICATION: L. 20, T. 10. This striking black-and-white-backed bird with its enormous tail and partly white wings is unique. Young birds have white spots on the black throat and upper breast, and their white markings are washed with sooty.

HABITS: Thickets lining the banks of watercourses through open western country are the home of this magpie, but it ranges over croplands, pastures, and sagebrush. The birds are seldom seen except in flocks. If not molested they are

frequent visitors around farm and ranch buildings. Their food is chiefly animal, large insects being the most important single item, but they take mice, snakes, young birds and eggs, carrion, fruit, and waste grain.

VOICE: The magpies' calls range from harsh cacks to mellow whistles. In captivity they imitate human speech. They are always noisy, and a flock keeps up a steady chatter.

NEST: A huge mass of coarse sticks with an opening in both sides leading to a cup of fine twigs, grasses, and rootlets cemented with mud and lined with fine grass and hair. Magpies breed in loose colonies. Streamside willow thickets are preferred sites. Nests may be almost on the ground or as high as 50 feet. The 5 to 9 eggs (1.25 x .90) are evenly and heavily marked with brown.

RANGE (R.) Northern Hemisphere. In North America from s. Manitoba, c. Alberta, c. Yukon, and s. Alaska south to n. Arizona and n.w. Texas; from Kansas and the Dakotas west to the Sierra and Cascade mountains. In winter wanders casually east to Illinois.

Common Raven*

Corvus corax—#7

IDENTIFICATION: L. 25. The common raven is the largest passerine bird. Its wingspread is more than 4 feet against the 3 or less of the common crow. It has a longer, heavier bill, a more triangular head, a rough shaggy throat, and long central tail feathers which make the tail appear rounded at the end. In flight it seldom holds a steady course but turns from side to side and sails at frequent intervals. When overhead a bulge in the head near the base of the bill is noticeable. In flight the wings break sharply at the shoulder, the primaries tend to fan out until they separate, and when the bird sails the wings are held flat, not up in a V like a crow's.

HABITS: These ravens seem most at home along seacoasts and large rivers and in rugged mountainous country. In the

North, where they are valued as scavengers and not molested, they are village birds, but farther south they retire from settled areas. They learn the range of a gun quickly and take no chances, but their scavenging habits make them frequent victims of baited traps and poisoned carcasses.

During the breeding season ravens are solitary. They seem to pair for life and use the same nest site year after year. Cliffs are preferred, and the birds often nest in close association with cliff-nesting falcons. Excellent fliers, they are prone to such aerial acrobatics as wing overs, dives, and tumbles. They can soar and hover like a hawk and seem to revel in mock combat with hawks and other large birds. Crows frequently call attention to the presence of a raven by mobbing it as they do hawks and owls. In the fall there is a movement to better feeding grounds toward the seacoast or southward, and ravens are occasionally seen along the main hawk flyways. In winter they often feed and travel in small flocks and, when abundant, spend the night in communal roosts.

Ravens are essentially scavengers and compete with gulls and vultures in cleaning up dead animals and picking up refuse. When nesting near large bird colonies they prey heavily on eggs and young. Berries are eaten in the fall and in the spring, like gulls, ravens will follow the plow for insects. Small mammals—mice, lemmings, rabbits, and young seals—are caught, often through the co-operative efforts of the pair. Again like gulls, ravens have learned to drop shellfish from a height to break them open.

VOICE: Ravens have a wide vocabulary, varying from the well-known deep, harsh, guttural croak to rich, almost bell-like gurgling notes. The croak, their commonest call, distinguishes them from a crow.

NEST: A thick mass of heavy sticks 3 to 4 feet across with a cup in the center of such soft material as fur, hair, moss, lichens, or seaweed. The site may be a protected cliff

ledge or a tree, generally a conifer, where the nest is lodged in a main crotch as near the top as possible. The 4 or 5 greenish eggs (1.90 x 1.28) may be heavily or lightly spotted with brown. The bird is an early nester.

RANGE: (R.) Northern Hemisphere. In North America from n. Greenland, the Arctic islands, and n.w. Alaska south to coastal Maine, n. Georgia, Michigan, North Dakota, and Nicaragua.

White-necked Raven*

Corvus cryptoleucus—#7

IDENTIFICATION: L. 20. This bird has all the typical raven characteristics but is not much larger than a crow. It looks black unless the neck and breast feathers are ruffed up to show their white bases. Young birds have the base of the mandible pale pink and lack the pointed feathers that give the throats of the adults such a rough appearance. The voice is the best field character.

HABITS: This raven is a bird of level short-grass country and adjacent desert scrub. Solitary nesters, they become gregarious after breeding and gather at night into large roosts in the brush. They move southward in fall and spend the winter in flocks that are sometimes enormous. They show little fear of man and visit towns and villages to feed in streets and yards.

Their food is about half animal and half vegetable—insects, especially grasshoppers and worms; carrion and wild fruits, plus cultivated crops like grain sorghum, corn, peanuts, and melons.

VOICE: Guttural croaks deeper than a crow's but less resonant and not as deep as those of its larger relative.

NEST: The birds use any bush, tree, or artificial structure that enables them to get the nest as far off the ground as possible. This may be 4 or 40 feet. Usually the nest is quite conspicuous in the open country which they inhabit. Nests, used year after year, are loosely built of thorny twigs,

with an inner cup lined with bark shreds, wool, or moss. The bird nests late. Five to 7 greenish eggs (1.75 x 1.20) with longitudinal purple streaks overlaid with brown spots are a normal clutch.

RANGE: (P.M.) Breeds from c. Texas, New Mexico, and Arizona south to c. Mexico. Winters from s. Texas and southern border of New Mexico and Arizona south.

Common Crow*

Corvus brachyrhynchos—#7

IDENTIFICATION: L. 19 (remember this length and use it as a yardstick to measure other birds). The common crow is distinguished by its deep, steady wingbeat. The bird often looks as if it were rowing through the air.

HABITS: The changes wrought by civilization have been almost wholly favorable to the common crow. Croplands replacing forests give year-round feeding grounds, and scattered forest remnants provide ideal nesting sites, while in the former grasslands man has provided both food and nest trees.

When the breeding season is over crows begin to gather in flocks, and in fall the more northern birds move southward. In winter communal roosts are established where from 5,000 to 200,000 birds gather for the night. During the day they travel out as much as 50 miles to feed.

The common crow eats quantities of insects, both as adults and as larvae. Its staple winter food is waste corn, and the cornfield acreage of an area roughly determines the number of wintering crows. The birds are omnivorous: as opportunity presents they eat carrion, shellfish, mice, reptiles, wild fruit, seeds, nuts, and the eggs and young of birds. They are often persecuted because of these much-exaggerated depredations. Actually there is no proof that any species of bird is less numerous because of the crow.

VOICE: Everyone knows the adult's *ca-ab, ca-ab, ca-ab*. Young crows have a different squawk-like call and adults are capa-

ble of a variety of calls at various pitches. These should be learned so they will not be mistaken for those of a raven or fish crow.

NEST: Usually in woods well up in a tree but occasionally as low as 6 feet. Sometimes in an isolated tree or bush. The large, well-built nest is made of sticks and lined with soft material. The 3 to 5 greenish eggs (1.65 x 1.19) are irregularly blotched with brown. Crow nests weather well and are often used in subsequent years by other birds, like long-eared owls and various hawks.

RANGE: (P.M.) Breeds from Newfoundland, s. Quebec, n. Manitoba, s.w. Mackenzie, and c. British Columbia south through Florida, the Gulf Coast, New Mexico, and n. Lower California. Winters from extreme s. Canada south.

Fish Crow*

Corvus ossifragus—#7

IDENTIFICATION: L. 17. The fish crow is much slimmer, has more pointed wings, and is smaller than a common crow. Its note is its best field character. The longer, more squawk-like call of a young common crow should not be confused with the short, abrupt call of this species. Habitat, gregariousness, soaring, and hovering help identification.

HABITS: The fish crow is a bird of low coastal country, but it also frequents rivers, swamps, and lakes for some distance inland. It is found almost everywhere in Florida. Fish crows are at all seasons more gregarious than the common crow. In winter their enormous night roosts are often shared with their larger relative. The fish crow sails almost as much as a raven and often hovers in one place as it looks for food on the surface of the water.

It is always in evidence around nesting colonies of southern water birds, as it is very fond of eggs. It eats insects, corn, and many kinds of wild fruits, but much of its food is gleaned along the shore and in the tidal marshes, where it obtains marine and aquatic organisms of all kinds.

VOICE: The call is a short, hoarse *kock*, closer to a black-crowned night heron's *quowk* than to a common crow's *caw*. A 2-note *oh-oh* is frequent.

NEST: Small breeding colonies are usually formed in favorable sites. Nests may be high in deciduous trees in swamp woodlands or lower in clumps of hollies, cedars, or pines near the coast. The nest is compactly built of sticks and lined with bark shreds, often pine needles, and sometimes hair. The 4 or 5 eggs (1.50 x 1.10) are like the ordinary crow's in color.

RANGE: (P.M.) Breeds along the Atlantic and Gulf coasts from s. Connecticut south to Florida and west to e. Texas. In fall there is a considerable southward movement, but some birds winter around New York City. In spring a few get as far north as Massachusetts.

TITMICE

Family PARIDAE

Black-capped Chickadee*

Parus atricapillus—#15

IDENTIFICATION: L. 5¼. The black cap separates this species from the more northern brown-headed chickadee. The narrow white feather edges which give the folded wing a finely striated look and the white tipped lower throat feathers which effect a gradual transition from the black of the throat to the white of the breast are the only plumage differences between it and the Carolina chickadee. In the field the difference in voice is the best means of identification.

HABITS: In summer this is a woodland species, but it often ranges into adjacent orchards and shade trees. Later the birds roam more widely in small noisy flocks that are often joined by other birds. Their easily whistled notes, a kiss on the back of the hand, or a screech owl imitation attracts them. They come readily to window-shelf feeders

baited with sunflower seeds, suet, or peanut butter. Their natural food is chiefly insects—adults and larvae in summer, eggs and pupae in winter—plus some wild berries, seeds, and fruits.

VOICE: This bird was named after its best-known call, a rapid *chick-a-dee*. The final *dee* is usually a series of 3 to 10 notes. Another call is a slower softly whistled *dee-dee*, the first note higher than the second.

NEST: Typically a cavity excavated by the birds in the center of a very rotten birch or pine stump, the entrance 1 to 10 feet aboveground. Natural cavities, old woodpecker holes, and bird boxes up to 50 feet high are also used. The cavity is filled with moss, plant downs, fur, and feathers. Six to 8 white eggs (.60 x .48) lightly speckled with brown are normal, but 10 is not unusual.

RANGE: (P.M.) The Northern Hemisphere. In North America from Newfoundland, c. Quebec, n. Ontario, c. Mackenzie, and c. Alaska south to n. New Jersey, North Carolina (mts.), Indiana, s. Missouri, n. New Mexico, and n.w. California. In winter south to Maryland and c. Texas.

Carolina Chickadee*

Parus carolinensis—#15

IDENTIFICATION: L. $4\frac{1}{2}$. This small southern chickadee has a relatively shorter tail and larger bill, more uniformly gray wings, and a sharper line of separation between the black of the throat and the white of the breast than the black-capped. The extra notes in the *dee-dee* call are the best field character.

HABITS: The Carolina chickadee is more closely confined to woodlands and is more sedentary than the black-capped. Moths and their larvae and eggs, acorns and poison-ivy berries are the most important animal and vegetal foods. Despite the remarkable similarities between this bird and the preceding, the boundary between their ranges is sharply defined, and apparent hybrids are uncommon.

VOICE: The *chick-a-dee* is more hurried and at a higher pitch than a black-capped's. Instead of giving a simple, clear, whistled *dee-dee*, the Carolina doubles each note to *tsee-dee*, *tsee-dee* or *dee-tsee*, *dee-tsee*, the *tsee* softly whispered and lower.

NEST: Nesting habits, nest, and eggs are essentially like the black-capped's, but this species is a little more likely to choose a wet woodland for nesting.

RANGE: (R.) Occurs from c. New Jersey, c. Ohio, c. Missouri, and n. Oklahoma south to Florida and the Gulf Coast to c. Texas.

Brown-capped Chickadee* *Parus hudsonicus*—#15

IDENTIFICATION: L. $4\frac{3}{4}$. Its brown cap, rich brown flanks, and distinctive *chick-a-dee* give all the field characteristics one needs.

HABITS: The vast northern forests to the limit of trees is the year-round home of these delicate-appearing little birds. They seem equally at home in conifers, birches, and streamside willow thickets. In fall and winter they wander through the woods accompanied by black-capped chickadees, nuthatches, and woodpeckers. At times there is a southward movement, but it is erratic. Their food is chiefly tree-infesting insects, plus some fruit and the seeds of conifers and birches. It is amazing that these tiny birds can get enough food in a northern winter day of only a few hours to enable them to survive the sub-zero temperatures of the long nights when they cannot refuel themselves.

VOICE: This species says *chick-a-dee* in a weak, husky voice, with each phrase drawn out and slurred downward. It has a number of distinctive *chip* notes uttered in a sharp, petulant tone. It also has a short warbled song.

NEST: In a natural cavity, woodpecker hole, or a hole dug by the birds in a rotten stump at a height of from 1 to 10

feet aboveground. The eggs are closely held in a mass of moss, bark shreds, and fur. Five to 7 white eggs (.61 x .50) sparingly speckled with reddish-brown are normal.

RANGE: (R.) Occurs from Labrador, c. Mackenzie, and n.w. Alaska south to Maine, n. New York, c. Ontario, c. Manitoba, and s. British Columbia.

Tufted Titmouse*

Parus bicolor—#15

IDENTIFICATION: L. 6. The crest and brown flanks are the best field marks. The Carolina wren repeats a similar series of identical phrases, but its voice is richer and the phrases always 3-noted.

HABITS: The tufted titmouse is seldom far from woodland and in the breeding season shows a preference for moist bottom lands and swamps. If shade trees are dense it may be common in residential areas. In winter it wanders over the countryside in the company of chickadees, kinglets, and other small birds. Titmice feed like chickadees, working twigs, buds, and bark for insect egg masses and pupae. Their most important food in summer is caterpillars, in winter beechnut and acorn mast.

VOICE: A series of 4 to 8 clear, whistled phrases consisting of a high followed by a lower note, rarely the reverse. The phrases vary from *peter* or *peta* to *wheelde* or *daytee*, but all in a series are the same. The titmouse is a loud, persistent singer the year round.

NEST: In any natural cavity in a tree, in an old woodpecker hole, or a bird box, the height ranging from 3 to 90 feet. The cavity is stuffed with leaves, bark shreds, and moss; the center cup padded with hair, string, or rags and, quite often, a cast-off snakeskin. The 5 to 6 white eggs (.73 x .65) are evenly speckled with fine brown dots.

RANGE: (R.) Occurs from New Jersey, Ohio, Illinois, and Nebraska south to s. Florida, the Gulf Coast, and c. Texas.

Black-crested Titmouse**Parus atricristatus*—#15

IDENTIFICATION: L. $5\frac{1}{2}$. The color of the forehead is always distinctive although it varies from pure white to deep brown, possibly as a result of hybridization with the tufted titmouse. The black crest feathers of females and young are gray-tipped, but the crest is always darker than the tufted's.

HABITS: This bird is common wherever trees are reasonably plentiful. It behaves and feeds like the tufted titmouse and is equally noisy.

VOICE: A monotonous whistled repetition of a short 1-note call—*pete* or *bew*.

NEST: In a cavity from 3 to 20 feet up in a tree or fence post, or in a woodpecker hole or bird box, wherever there is timber. The nest is the usual titmouse collection of soft materials from a variety of sources and generally includes a snakeskin. The 4 to 7 white eggs (.67 x .51) are spotted with brown.

RANGE: (R.) Occurs from c. Texas east almost to Louisiana and south to e.c. Mexico.

Verdin**Auriparus flaviceps*—#16

IDENTIFICATION: L. $4\frac{1}{4}$. The female is slightly duller than the male, but both are unmistakable. Young birds lack yellow or brown and are a uniform brownish-gray above, paler below. Bush tits are similar but have longer tails and a different voice.

HABITS: The verdin seems to have no need of water either for drinking or bathing. Although commoner in dense thickets, it is found in arid country wherever scattered thorny desert shrubs and cacti occur. Its frequent associates are cactus

wrens, curve-billed thrashes, and horned toads. Insects and berries, for which it forages like a chickadee, seem to be its sole foods.

VOICE: The song, which carries a long way, is a series of 3 or 4 clear, whistled notes on the same pitch. Its numerous calls are chickadee-like sequences rapidly uttered and run together. While feeding, mated birds keep together with a frequent loud "slip" note.

NEST: A large (up to 8 inches) ball-like mass of thorny twigs woven around a fork near the end of a branch. The entrance is in the side, and the center is lined first with leaves and grasses, then stuffed with feathers. The nests are from 2 to 20 feet up in low trees or shrubs. In addition, individual birds build similar but often smaller (3-inch) nests in which they spend winter nights. The 4 or 5 pale bluish-green eggs (.58 x .43) are marked with scattered brown dots.

RANGE: (R.) Occurs from s. Texas, s.e. New Mexico, s.w. Utah, and s. California south through n. Mexico.

NUTHATCHES

Family SITTIDAE

White-breasted Nuthatch*

Sitta carolinensis—#14

IDENTIFICATION: L. 6. The habit of creeping down tree trunks headfirst distinguishes the nuthatches. The solid black cap (sometimes gray in females or young) and the under parts, which are clear white except for an inconspicuous rusty wash on the flanks and under tail coverts, are good field marks.

HABITS: This species frequents large trees in forests, orchards, and towns. The birds seem to stay paired for life and to maintain a winter as well as a breeding territory, though in winter they sometimes join mixed bands of chickadees and kinglets as they forage through the woods. Nuthatches

obtain most of their food on the trunks and larger branches of trees. Insect eggs, pupae, and hibernating adults which they find in the crevices of bark are their winter mainstays, but they also eat seeds, acorns, fruits, and feeding-station suet.

VOICE: Throughout the year both sexes constantly utter a distinctive nasal *yank*. The rarely heard spring song is a series of about a dozen low notes whistled on the same key.

NEST: In a cavity at almost any height aboveground. Rotted-out knotholes or similar natural openings seem preferred, but old woodpecker holes are used. Occasionally the birds excavate their own hole or use a bird box. The cavity is lined first with twigs, bark shreds, grass, and leaves, the eggs being laid on an inner lining of fur and feathers. The 5 or 6 eggs (.75 x .56) are lightly speckled with red-brown and pale purple.

RANGE: (R.) Occurs from s. Quebec, c. Ontario, s. Manitoba, and s. British Columbia south to Florida, the Gulf Coast, and s. Mexico.

Red-breasted Nuthatch*

Sitta canadensis—#14

IDENTIFICATION: L. $4\frac{1}{2}$. The small size, the white line over the eye, and the extensively brown under parts are distinctive. Females and young have slate-gray rather than black head markings and are paler below.

HABITS: This active little bird is a resident of northern ever-green forests. The seeds of conifers seem to be its important winter food, and its periodic southward flights are presumed to be correlated with a scarcity of such seeds. In the South it also feeds on insects in the bark of deciduous trees but continues to prefer conifer seeds. The birds are commonly found among the finer twigs and branches of treetops. They like suet, nutmeats, and sunflower seeds and will carry food off and hide it in holes and bark crevices.

VOICE: The call is an *ank*, more abrupt, nasal, and high-pitched than a white-breasted's. The song is a rapid series of short musical notes with a tin-horn quality.

NEST: Usually in a hole which the birds excavate at almost any height in the soft wood of a dead stub. They may use an old woodpecker hole, natural cavity, or bird box. The 5 or 6 white eggs (.60 x .50) are rather heavily spotted with red-brown.

RANGE: (P.M.) Breeds from Newfoundland, s. Quebec, n. Manitoba, c. Yukon, and s.e. Alaska south to Massachusetts, s.w. North Carolina (mts.), Michigan, Colorado, and s. California. In winter moves south in varying numbers and occasionally reaches n. Florida, the Gulf Coast, and n. Mexico.

Brown-headed Nuthatch*

Sitta pusilla—#14

IDENTIFICATION: L. $4\frac{1}{4}$. The brown head and white nape spot are diagnostic. Young birds are duller, the head gray-brown to gray and the sides brown.

HABITS: Although found in all types of open woodland from cypress to scrub oak, this species is most abundant in pine. Decaying snags in burns and clearings attract them, and they often feed in young seedling pines on abandoned farmland. After the breeding season they form bands of 6 to 20 individuals and roam noisily through the woods with woodpeckers, kinglets, and titmice. They commonly forage from the main stem of a tree to the topmost branch tips. Pine seeds and many kinds of insects appear to be their food.

VOICE: Nasal, but much reedier and harsher than that of the two preceding species. The various notes are too numerous to describe: some are like a chickadee's, others like a goldfinch's. The birds generally keep up a stream of chirping, twittering, and hissing. The commonest sound is a 3-note call.

NEST: At any height, but normally 4 to 10 feet up in a dead tree stump or fence post. The birds excavate the hole and line it with bark shreds, fur, feathers, and pine-seed wings. The 5 or 6 white or creamy eggs (.62 x .49) are heavily spotted with shades of red-brown.

RANGE: (R.) Occurs from s. Delaware, Kentucky, and s. Missouri south to Grand Bahama, the Gulf Coast, and e. Texas.

CREEPERS

Family CERTHIIDAE

Brown Creeper*

Certhia familiaris—*15

IDENTIFICATION: L. 5½. The creeper's habit of spiraling up a tree trunk, then dropping to the base of another to repeat the process, is distinctive. Its slim curved bill is a good point to note.

HABITS: Mature forests are the favored home, but the birds occur in most well-wooded regions either as breeders or winter visitors. The dense growth in wooded swamps, together with the greater frequency of dead trees with hanging strips of loose bark, attracts them to such areas for breeding. In migration and on its wintering grounds almost any tree will do, in or out of a forest, and at such times they are often fairly gregarious. Frequently small bands of creepers work through the winter woods with a sociable assemblage of chickadees, kinglets, and woodpeckers. They seem largely insectivorous, but they like suet.

VOICE: The year-round call notes are a faint single, short, kinglet-like lisp and a rather long, thin, high-pitched, rolling trill. The song is a variable 5- or 6-note jumble of long-and-short, somewhat musical, but high, thin notes with a hissing quality.

NEST: Generally not far aboveground against the trunk of a dead tree underneath a strip of loose bark. Occasionally in a rotted-out cavity or old woodpecker hole. The nest

is made of bark shreds, moss, sticks, and feathers. The 6 or 7 white eggs (.58 x .48) are sparsely scattered with fine brown spots.

RANGE: (P.M.) Breeds throughout a large part of the Northern Hemisphere. In North America from Nova Scotia, c. Ontario, s. Manitoba, and c. Alaska south to Massachusetts, North Carolina (mts.), n. Indiana, e. Nebraska, and in the western mts. south to n. Nicaragua. Winters south to s. Florida, the Gulf Coast, and c. Texas.

WRENS

Family TROGLODYTIDAE

House Wren*

Troglodytes aedon—#16

IDENTIFICATION: L. $4\frac{3}{4}$. The house wren's best characteristic is its lack of distinctive markings. It is dull gray-brown above, dull white below, with a moderately long tail and no pronounced eyeline.

HABITS: This wren does most of its feeding in low woody vegetation, preferably deciduous, and is found in brushy areas on the edges of woodland, in sunny openings within the forest, and in the East near human dwellings when suitable growths and nest-site cavities are present. Its food consists wholly of small insects.

With few exceptions, all breeding birds defend an area about the nest from intrusion by others of their kind. This area, or territory, varies from a few inches in colonial nesters to a quarter of a mile or more with hawks. Generally the presence of other species is ignored, even when they, too, are nesting, but the house wren occasionally breaks the rule and punctures the eggs or kills the young in the nests of other birds within its domain.

VOICE: Wrens are great scolders, and this species utters a deep, grating chatter. Its song is a long series of short, not very musical notes poured out in a rapid burst that suddenly

rises and then falls. It is a persistent singer, but the effect is remarkable more for bubbling energy than beauty.

NEST: Under wild conditions the site is a tree hollow or old woodpecker hole. Now a bird box or almost any sort of cavity about a building seems preferred. The entrance is seldom more than 10 feet aboveground. Sticks, grass, and other debris are stuffed into the enclosed space until a small hollow, lined generally with softer material, is left for the 6 to 8 white eggs (.65 x .50), which are thickly speckled with fine brown dots.

RANGE: (M.) Breeds from New Brunswick, s. Ontario, s. Manitoba, c. Alberta, and s. British Columbia south to w. South Carolina, Kentucky, s. Missouri, c.w. Texas, s. Arizona, and n. Lower California. Winters from South Carolina, the Gulf States, Texas, and California south to s. Florida and s. Mexico.

Winter Wren*

Troglodytes troglodytes—#16

IDENTIFICATION: L. 4. The very short tail and dark barred belly of this tiny wren are distinctive, as are its continuous nervous babbling and its habit of cocking its tail over its back.

HABITS: In summer the winter wren is found in the depths of coniferous woodlands, in swamps, at streamsides, and in other cool, moist spots. It obtains its insect food among fallen logs, brush piles, and tangles of low shrubbery near the ground. In the deciduous woodlands which it visits at other seasons it is found in similar locale. When not in song it is so secretive that it is often overlooked. In marked contrast to our many wrens, Europe has only this one species.

VOICE: The alarm notes are a short single or double high-pitched tick or a longer *crrrrrip*. The song has great beauty and remarkable length. The high-pitched notes, uttered

rapidly, rise and fall to produce a clear, melodious, and bubbling warble broken by 1 or more trills.

NEST: The most favored location is in a recess in the upturned root mass of a fallen tree. Other sites are under stream banks, among fallen logs or the roots of old trees. A bulky mass of twigs and moss with the entrance on the side; the center is lined with feathers and fur. The 5 or 6 eggs (.69 x .50) are sparingly to well speckled with brown dots.

RANGE: (M.) Much of the Northern Hemisphere. In North America it breeds from Newfoundland, n. Ontario, s. Manitoba, s. Alberta, s. Alaska, and the Pribilof Islands south to Massachusetts, n. Georgia (mts.), c. Michigan, c. Minnesota, n. Colorado, and c. California. Winters from s. New England, s. Michigan, Iowa, Colorado, and s. British Columbia south to c. Florida, the Gulf Coast, s. New Mexico, and s. California.

Bewick's Wren*

Thryomanes bewickii—#16

IDENTIFICATION: L. $5\frac{1}{4}$. Its slim shape and long fanlike, white-tipped tail which it constantly flirts from side to side are its best field marks.

HABITS: This wren likes the varied landscape which general farming produces—brush piles, thickets, and fence rows with an abundance of good nest sites about the buildings. Sometimes it is the commonest bird of urban residential areas. In wild country it frequents open or sparsely wooded land, provided there is a dense undergrowth of scrubby trees or shrubs. It depends wholly upon insects and seldom feeds far from the ground.

In parts of the Midwest this species appears to be extending its range northward at the expense of the house wren. Neither will tolerate the other on its breeding territory. In areas that have recently become warm enough or have been otherwise altered so Bewick's can remain through the winter, the birds stake out their territorial

claim long before the arrival of the migrant house wren, and this seems to give them a critical advantage in the struggle.

VOICE: Call, a single or double *plit*. Alarm notes are a series of low, buzzy sounds. The highly variable song is often loud (carries $\frac{1}{4}$ to $\frac{1}{2}$ mile), clear, and melodious, suggesting those of the lark and song sparrows.

NEST: In the wild, in knothole openings, old woodpecker nests, and dense brush piles. Around buildings, in tin cans, in coats, hats, or baskets hung in sheds, in openings behind loose boards, or almost anywhere else that provides a suitable cavity. The nest, which is open on top, fills the cavity. It is made of sticks, leaves, and other debris, finished off with a deep cup of feathers and other soft material. The 5 to 7 white eggs (.66 x .50) are irregularly marked with brown dots.

RANGE: (P.M.) Breeds from c. Pennsylvania, s. Michigan, s. Nebraska, s. Utah, and s. British Columbia south to w. South Carolina, c. Alabama, c. Arkansas, and s. Mexico. In winter wanders south to c. Florida and the Gulf Coast.

Carolina Wren*

Thryothorus ludovicianus—#16

IDENTIFICATION: L. $5\frac{3}{4}$. This large chunky wren is redder above than any other and buffy below, especially on the flanks.

HABITS: Woodland thickets, stream-bank tangles, fallen tree-tops, and rocky brush-grown slopes are favorite haunts. Like the Bewick's and house wrens, this species becomes common about dwellings in some regions, but in others shows little tendency to adapt itself to such environment. Insects, plus a few berries and seeds, like bayberry, poison ivy, sumac, and sweet gum, are its only known foods. The best way to see this or any other wren is to sit still and squeak on the back of one's hand. Before long the wren,

bobbing up and down, waving its tail and scolding, comes to see what is going on.

Along the northern limit of its range the Carolina varies in abundance. Population pressure or a tendency to wander brings young birds north of where they were raised; if the winter is mild they survive to breed the following spring. Over a number of years this may result in a northward spread of many miles and the establishment of large colonies. Eventually, however, an especially severe winter wipes out the northern population, and the process starts all over again.

VOICE: This wren sings all year, all day, in all weather. The song consists of a highly variable 3- (occasionally 2-) note phrase like *toodlewee* or *tawee*, repeated rapidly 4 to 6 times in a loud, ringing whistle. A frequent call note is a long-drawn-out trill *chirrrrrrr*.

NEST: Although displaying the customary wren preference for cavities, this bird occasionally builds a ball-like nest of sticks with a side entrance to a center cavity lined with feathers. The nest may be in a tree or close to the ground in matted vegetation. More commonly the bird uses holes in trees, stumps, roots of fallen trees, and crannies about man-made structures. The 5 whitish eggs (.74 x .60) are variable but generally heavily spotted with browns.

RANGE: (R.) Occurs from Long Island, New York, s. Pennsylvania, and s. Iowa south to Florida, the Gulf Coast, and n. Mexico and west to e. Nebraska and c. Texas.

Cactus Wren*

Heleodytes brunneicapillus—#18

IDENTIFICATION: L. 8. This big wren looks more like a thrasher. The concentration of dark markings on the upper breast (less pronounced in young birds), the strong white eyeline, and the black-and-white barring of the outer tail feathers are diagnostic.

HABITS: These wrens are closely confined to arid areas where desert plants provide nest sites and refuge. The males sing from prominent perches and are easily seen. Although often abundant, there are not as many pairs in an area as one would assume from the nests. Generally each pair has several dummy nests besides the one currently in use for raising young or for night roosting. The cactus wren varies its insect diet with more seeds and fruits than most wrens and does most of its feeding on the ground.

VOICE: This wren sings the year round and is a persistent all-day singer. The song is an unmusical, accelerating series of uniform notes which sound something like grating stones. Its scolding calls are harsher.

NEST: A football- or retort-shaped mass of coarse to fine plant fibers lined in the center with fur or feathers and entered from the side; conspicuously placed in the tops of thorny desert shrubs or cactus. The 4 or 5 slightly buffy eggs (.95 x .65) are thickly but finely sprinkled with brown.

RANGE: (R.) Occurs from c. Texas, s. Utah, and s. California south to c. Mexico.

Long-billed Marsh-wren*

Telmatodytes palustris—#16

IDENTIFICATION: L. 5. White-streaked backs distinguish the marsh-wrens. The solid, unstreaked crown bordered by a strong white eyeline, the larger size, the long, slender, curved bill and wetter habitat preference help to separate this from the short-billed species.

HABITS: These birds are found only where tall, coarse vegetation grows in shallow water over a fairly extensive area. Males are commonly polygamous, with 2 or more mates, the females being established in adjacent territories of about 1/3 acre each. The presence of other species within these territories is sometimes resented and their eggs punctured. Two broods are generally raised.

VOICE: When alarmed the birds give a series of grating notes run together in a chatter. The male's song is delivered from a reed or as it flutters in air on trembling wings. The song begins with a few scraping notes, then breaks into a loud, rapid, almost trill-like series of rattling notes, ending abruptly in a weak whistle. During the nesting season the birds sing endlessly in the darkness of early morning or late evening and through much of the day.

NEST: In cattails, bulrushes, tules, or other tall marsh plants growing in shallow water. The large coconut-shaped nest with its side entrance is lashed to the supporting stems and leaves at a height of from 1 to 3 feet. The outside is woven of long, coarse, water-soaked leaves. Inside, the material becomes finer and softer toward the center cavity, which is lined with feathers. While the female is building the actual nest the male may build a half dozen or so incomplete "dummy" nests. The 5 or 6 pale brownish eggs (.64 x .45) are heavily sprinkled with fine brown dots.

RANGE: (P.M.) Breeds from s. New Brunswick, s. Ontario, c. Manitoba, c. Alberta, and c. British Columbia south to c. Florida, the Gulf Coast, Texas, New Mexico, and n. Lower California. Winters from s. New Jersey, the Gulf States, c. Texas, Utah, and Washington south to s. Florida and c. Mexico.

Short-billed Marsh-wren* *Cistothorus platensis*—#16

IDENTIFICATION: L. 4. Its smaller size and bill, streaked head, and more uniformly brownish appearance, without a sharply defined blackish area on the back, distinguish this species from the long-billed. However, song and habitat differences are safer field guides.

HABITS: Shallow sedge marshes and damp grassy meadows with little or no standing water but frequent scattered shrubs are the home of this, our smallest bird except for

the hummingbirds. Its breeding habitat often lies between dry uplands and the cattail home of the long-billed. Favored areas are often densely colonized while others, equally appropriate, have few or no birds, and the population in any given area is apt to fluctuate from year to year. The birds can be flushed but are hard to observe, as they flutter only a short distance before dropping back into the grass.

VOICE: The call note, a short, high tick, is easily recognized. The weak, dry, unmusical song opens with several deliberate notes which change to a series of rapid, falling notes that accelerate to a buzzy trill at the end—*chap-chap-chap-chap-cherrrrrrr*. The song is generally delivered from a fixed series of strategically located vantage points.

NEST: The inconspicuous, well-hidden nests are placed in thick growths, preferably of grasses or sedges, close to the ground. The ball-like structure with its small side entrance is made of dead and growing grass leaves and lined with finer material, including feathers and fur. Males, like long-billeds, construct numerous, apparently useless, "dummy" nests. The 7 eggs (.69 x .50) are pure white.

RANGE: (M.) Breeds from s. Maine, s. Ontario, c. Manitoba, and s.e. Saskatchewan south to n. Delaware, c. Indiana, c. Missouri, and e. Kansas. Winters from s. New Jersey and s. Illinois south to s. Florida, the Gulf Coast, and s. Texas.

Cañon Wren*

Catherpes mexicanus—#16

IDENTIFICATION: L. 5½. The rich reddish-brown belly contrasting with the pure-white throat distinguishes this species from the equally spotted but much grayer-brown rock wren.

HABITS: The cañon or canyon wren is well named, as its favorite home is the steep, rocky side of a canyon, preferably one carrying water. A singing bird is often hard to

pick out among the broken rocks, even when it is flooding the valley with music. The bird lives on insects and seems to do all its feeding on rock surfaces. In some places it has adopted stone buildings and is common in business and residential areas—fearlessly entering and even nesting in occupied houses.

VOICE: The song is a startlingly loud series of 7 to 12 silvery, bell-like whistles, beginning high and running down the scale to end in a low trill. The effect as these echo from the walls of a narrow canyon is startling.

NEST: In crevices in rock walls, on rock shelves in caves and overhangs, occasionally in cavities about buildings or under eaves. The flat, open-topped, cuplike nest is made of fibrous and soft material, like moss, catkins, wool, and feathers. The 5 or 6 white eggs (.70 x .52) are sparingly marked with fine reddish-brown dots.

RANGE: (R.) Occurs from c. Texas, n. Colorado, and s. British Columbia south to s. Mexico.

Rock Wren*

Salpinctes obsoletus—#16

IDENTIFICATION: L. $5\frac{3}{4}$. The pale color, the faintly and finely streaked breast, and the broad black band near the end of the tail are the best field marks.

HABITS: Rocky barrens, talus slopes, bare outcrops, eroded badlands, and rough cliff walls exposed to full sunlight, often far from water, are the home of this wren. It seldom invades the shady, well-watered canyons where the cañon wren makes its home. In summer the birds range into high mountains, but many retire to lower levels in winter. They feed on rock surfaces and in crevices between rocks, where they find spiders and insects.

VOICE: The calls and songs are too varied for full description. Common calls are a loud purr-like trill and a tick'-ear. The song, which varies from harsh to sweet and musical, is

composed of 3 or 4 couplets or double syllables. It begins slowly and accelerates toward the end.

NEST: Under rocks, in old rodent burrows, holes, and crevices about cliffs, rocky ledges, gully banks, and stone walls. Less commonly in hollow logs and stumps or about buildings. The birds carefully pave the nest cavity with small, flat rock chips or similar hard material, often extending the entrance pathway for many feet. One bird used 1,665 pieces of stone, iron, shell, and bone for this purpose. The nest is of plant stems and roots, lined with finer material and finished off with fur and feathers. The 5 or 6 white eggs (.72 x .54) are sprinkled with brown dots.

RANGE: (P.M.) Occurs from w.c. Saskatchewan and s. British Columbia south to Guatemala and east to w. North Dakota and c. Texas.

MOCKINGBIRDS

Family MIMIDAE

Mockingbird*

Mimus polyglottos—#18

IDENTIFICATION: L. 10 1/2. A long-tailed, pale gray bird is apt to be a mocker. The white wing patches and outer tail feathers are distinctive but hard to see except in flight. The Townsend's solitaire of the West is darker below, has a white eye ring and a quite buffy wing patch.

HABITS: Our idea of what constitutes a pleasant, attractive setting for a rural or suburban home seems to coincide with a mockingbird's. It asks plenty of open area with a few trees, dense shrubbery, and a variety of edible fruits. Today mockers are commoner about towns and gardens than in the wild, though they still occur in suitable brushy spots on the edge of woodlands or in clearings. Their chief foods are berries, seeds, and fruits (wild or cultivated), supplemented by quantities of insects at certain seasons. The imitative ability of the mocker extends beyond

birds and often seems to include all common sounds of their environment, from the squeak of a wheel to the bark of a dog. The courtship performances are spectacular. The birds seem to establish a year-round territory which they defend not only against other birds but snakes, cats, and other potential enemies.

VOICE: The mocker has several harsh, grating calls. Its song is a medley of rich, melodious notes interspersed with harsher notes and imitations. Commonly each note is repeated, usually 3 times, before the bird shifts to another triple-noted phrase or imitation. Often the only way to distinguish the imitation from the real thing is that it is given 3 times in rapid succession. Occasionally a group of notes is repeated over and over before shifting to a phrase which is repeated a dozen or more times. Singing is usually from a high, conspicuous perch. It continues throughout the year but is most vigorous in spring, when the birds commonly sing through bright moonlight nights.

NEST: Generally about 4 to 12 feet up in a low tree or shrub; a bulky, loosely woven cup of sticks, stems, and trash. The 3 to 5 greenish to buffy eggs (.95 x .70) are blotched and spotted with brown.

RANGE: (R.) Occurs from Maryland, Ohio, s. Iowa, s. Wyoming, and c. California south to the Greater Antilles, the Gulf Coast, and s. Mexico. Rarely but regularly found as far north as s. Maine.

Catbird*

Dumetella carolinensis—#18

IDENTIFICATION: L. 9. There is no other black-capped, uniformly gray bird with brown under-tail coverts.

HABITS: The catbird's favorite wild environment is dense shrubbery and vine tangles near streams, ponds, and open alder swamps, but the brushy cut- or burned-over lands, hedgerows, field borders, and ornamental shrubbery of civilization have greatly expanded its range. Small fruits

seem to be the preferred food, but before these ripen the birds eat insects. Young are almost wholly reared upon insects. If catbirds are in the neighborhood they are invariably the first to arrive in response to a squeak upon one's hand to call out the bird population.

VOICE: Its common call is a catlike, mewing scold; others are a soft cluck and a series of sharp, snapping notes. Like its 2 relatives, it can be a fine singer and imitator, but it does little repeating and is more apt to sing from a concealed perch in shrubbery than from an exposed one. Its softer song consists of short phrases of 5 or 6 different notes broken by pauses and interspersed with mews and imitations. It often sings on moonlight nights and is one of the birds that has a fall "song period," during which it gives a rather formless and usually barely audible "whisper" song.

NEST: From 4 to 8 feet aboveground in dense shrubbery or vines; a bulky, ragged mass of twigs, leaves, and stems lined with a well-made cup of fine fibers. The 4 to 6 eggs (.95 x .70) are an unmarked glossy blue-green; 2 broods are usually reared.

RANGE: (M.) Breeds from Nova Scotia, s. Ontario, s. Manitoba, and c. British Columbia south to c. Florida, s.e. Texas, n.e. New Mexico, n. Utah, n.e. Oregon, and w. Washington. Winters from the Gulf Coast to Cuba and Panama.

Brown Thrasher*

Toxostoma rufum—#18

IDENTIFICATION: L. 11½. The thrasher's long curved bill, long tail, and brown streaked breast separate it from the thrushes.

HABITS: Dry thickets, brushy pastures, new second growth, and woodland borders and openings are the normal home. Willingness to accept similar habitats near dwellings varies in different parts of the country. Thrashers do most of their feeding on or near the ground, where they throw

the dead leaves aside with their bills and dig into the soil for insects. Two thirds of their food is insects, the rest berries, mast (chiefly acorns), and grain.

VOICE: Common call notes are a hissing sound, a clicking noise, and a 3-note whistle. The loud, rich song resembles a mocker's, but the majority of the bold, abrupt phrases are doubled rather than tripled notes. The song is less frequently interspersed with obvious imitations than the mocker's or catbird's. Singing is usually from a conspicuous treetop perch.

NEST: Commonly from 1 to 5 feet up in a dense and preferably thorny shrub. Rarely are they higher and in New England especially they are often on the ground under dense cover. The nest is large and often of 4 concentric layers, the outer of coarse twigs, the next of leaves, the third of small twigs and stems, the lining of fine rootlets. The 4 or 5 pale blue eggs (1.08 x .80) are evenly covered with fine brown dots; 2 broods are usually reared.

RANGE: (P.M.) Breeds from n. Maine, s.e. Ontario, n. Michigan, and s. Alberta south to s. Florida and the Gulf Coast to e. Louisiana. Winters from North Carolina and s.e. Missouri to s. Florida and c.s. Texas.

Long-billed Thrasher* *Toxostoma longirostre*—#18

IDENTIFICATION: L. 11½. This species differs from a brown thrasher in its darker, less reddish upper parts, black breast streaks, and the grayer sides to the head and neck. The bill is longer and only slightly curved.

HABITS: These birds are found in greatest numbers in dense undergrowth in rich bottom-land forests, but they also inhabit the dry mesquite and cactus tangles of the uplands. They seem to be chiefly insectivorous but take some fruits.

VOICE: The call notes are higher-pitched and sharper than a brown thrasher's, but the song does not differ significantly.

NEST: From 4 to 8 feet aboveground in the heart of a thorny plant or thicket. The nest is very like those of its near relatives. The 4 eggs (1.07 x .78) are like a brown thrasher's.

RANGE: (R.) Occurs from the c. Gulf Coast of Texas, south through e. Mexico to Puebla.

Curve-billed Thrasher* *Toxostoma curvirostre*—#18

IDENTIFICATION: L. 11. Of the four dull gray and brown thrashers with curved bills, this is the only one that comes east of the one hundredth meridian. The faintly spotted breast and bright reddish eyes are its most distinctive field marks. The white wing bars and tail tips are generally but not always conspicuous.

HABITS: Dry, semi-arid open country with scattered clumps of cactus and mesquite is the typical home. The bird feeds on the ground, tossing aside loose objects and digging deep for insects, its chief food. It eats some fruit.

VOICE: Its common call is a sharp 2- or 3-note whistle, but it trills and chatters like a wren. The song is a clear, melodious carol broken into short phrases with little repetition of notes.

NEST: From 3 to 10 feet aboveground in the center of a cactus clump, especially cholla, or in other thorny plants; made of twigs and lined with rootlets and other fine fibers. The 4 pale blue-green eggs (1.15 x .80) are minutely speckled with brown; 2 or 3 broods are raised.

RANGE: (R.) Occurs from s. Texas, s. New Mexico, and s. Arizona south to s. Mexico.

Sage Thrasher* *Oreoscoptes montanus*—#18

IDENTIFICATION: L. $8\frac{3}{4}$. Although small and short-tailed, this bird uses its wings and tail in typical thrasher fashion. The

white ends of the outer tail feathers and the streaked breast separate it from a thrush.

HABITS: The dry sagebrush plains are the typical summer home. The birds range into adjacent areas where bushy plants occur and in winter may be found in any area well provided with dense thickets. They feed on the ground, where they find such insects as locusts and beetles. In migration they display fondness for small fruits.

VOICE: A blackbird-like cluck and a high-pitched rally note are its commonest calls. The song is a pure-toned warble given from a high perch or on the wing. Seldom is there a pause as the notes pour out and as the song continues it becomes increasingly varied.

NEST: Occasionally on the ground but usually in a high bush, preferably armed with thorns. The loose, bulky nest is often partly arched over. It is made of coarse twigs and lined with grass and rootlets. The 4 or 5 deep blue-green eggs (.98 x .71) are boldly marked with brown blotches.

RANGE: (M.) Breeds from s. Saskatchewan and s. British Columbia south to n. New Mexico and s. California and east to w. Nebraska. Winters from s. Texas and s. California south through n. Mexico.

THRUSHES

Family TURDIDAE

Robin*

Turdus migratorius—#18

IDENTIFICATION: L. 10. (Remember this length and use it as a yardstick in estimating other medium-sized birds.) Adults are unmistakable. Females are slightly duller and paler than males, and the head is not as black. Young in juvenile plumage reveal the thrush in them by the spots on their breasts. These are lost when they molt into their immature plumage, which is much like the adult's.

HABITS: The robin is a bird of sparsely wooded barrens, cut-over areas, forest borders, and openings. With the coming of civilization it has found shade trees, orchards, lawns, and fields ideal for nesting and feeding. In many places it seems to have developed an affinity for man; often every nest in an area is near a house. In residential sections robins frequently reach greater population densities than in the wild. Those concerned over the predations of house cats would do well to ponder this fact. Wild predators are virtually absent from such areas, and nothing indicates that house cats take more than a compensatory toll. Apparently enough young robins survive out of the 2 broods each pair attempts to rear to replace the adults that die during the year.

The robin's food is varied. It is fond of fruit, eats quantities of earthworms and grubs from the ground, and many insects in their adult stages. During migration robins assemble in large flocks and on wintering grounds establish night roosts, usually in a secluded swamp. In the South such roosts are often enormous, the birds scattering during the day to feed in small flocks on the fruits of sour gum, chinaberry, and hackberry.

Every spring newspapers carry accounts of crazy robins pecking windowpanes, automobile windshields or hubcaps, or other polished surfaces. Often the birds peck until exhausted. The explanation is simple: The robin is not crazy but deluded. It takes the reflected image for a rival male trespassing on its nesting territory, and anything that stops the reflections stops the pecking.

VOICE: The robin has a variety of scolding, alarm, and call notes. Some are loud and piercing. The most unexpected is a thin, high-pitched hissing. The loud caroling song is composed of 2- and 3-note phrases broken by pauses. It has a cheerful bubbling quality, and there is a distinct change in pitch in each phrase. At daybreak, the robin's favorite song period, the carol often continues for minutes at a time. It should be carefully memorized, as many other bird

songs are described in terms of similarity to, or differences from, the robin's.

NEST: Anywhere from on the ground to treetops but commonly from 5 to 15 feet aboveground. A dense bush, a fork in a main branch of a tree, or a sheltered recess in a building are among preferred sites. Generally robins seek a place where the nest is sheltered from rain and saddled on a firm support. Possibly this is why evergreens are favored for first nests, while the nest for the second brood is often in a deciduous tree. The nest is of plant stems and trash cemented with mud, smoothed on the inside to form a solid mud cap. The 3 to 5 unmarked blue-green eggs (1.15 x .80) are laid on a lining of fine grass or similar material.

RANGE: (P.M.) Breeds from Newfoundland, n. Quebec, n. Manitoba, n. Mackenzie, and n.w. Alaska south to w. South Carolina, c. Alabama, Arkansas, and through Mexico to Guatemala. Winters in varying numbers as far north as s. Maine, s. Ontario, Nebraska, Wyoming, and s. British Columbia.

Gray's Thrush*

Turdus grayi—*19

IDENTIFICATION: L. 10. The robin-like appearance and behavior should make this an easy bird to identify. The dark grayish streaks on the pale throat and the slightly greenish bill with yellowish edges are unlike any thrasher's. Juveniles are thickly but inconspicuously spotted with dusky below and have pale streaks above.

HABITS: This is an abundant species throughout most of Middle America. It avoids arid areas and dense forests unless there is abundant undergrowth. Elsewhere, near clearings, forest borders, orchards and plantations, streamside and urban shade trees, it is common. In spring it sings from treetops like a robin but at other seasons is quiet. After

Yellow-billed
Cuckoo

p.4



Groove-billed
Ani

p.8



Smooth-billed
Ani

p.7



p.5

Black-billed
Cuckoo



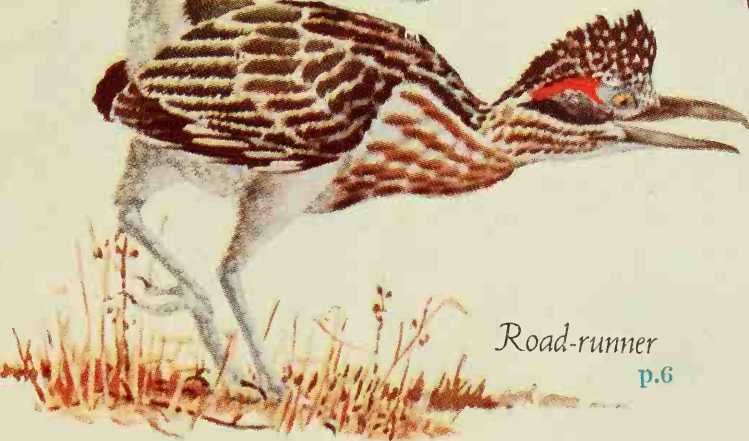
Black-eared
Cuckoo

p.3



Road-runner

p.6



Great
Horned
Owl
p.12



p.13

Snowy Owl



Great Gray Owl
p.18



Barred Owl
p.17



Long-eared
Owl
p.19



Short-eared Owl

p.20



Barn Owl
p.10



Saw-whet Owl

p.22

ADULT



JUVENILE



Boreal Owl

p.22



Ferruginous Pygmy Owl

p.15



Hawk Owl

p.14



RED
PHASE



GRAY
PHASE

Screech Owl

p.11

Burrowing Owl

p.16



Ivory-billed
Woodpecker ♂
p.50

Pileated
Woodpecker

Yellow-shafted
Flicker p.38

Red-bellied
Woodpecker p.41

Red-headed
Woodpecker p.43

Golden-fronted
Woodpecker ♂
p.42

JUVENILE

ADULT

Black-backed Woodpecker

p.48



Hairy Woodpecker

p.45



Three-toed Woodpecker

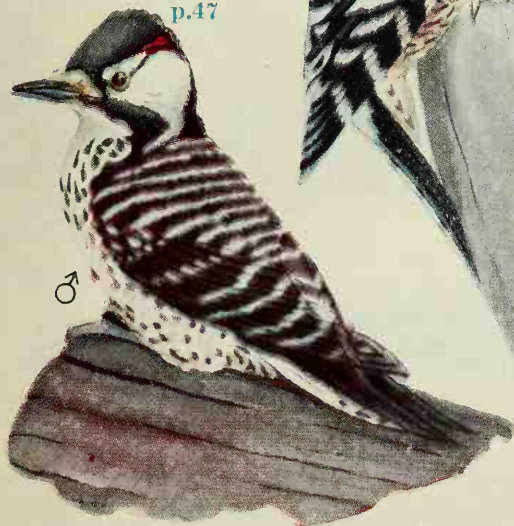
p.49

♂



Red-cockaded Woodpecker

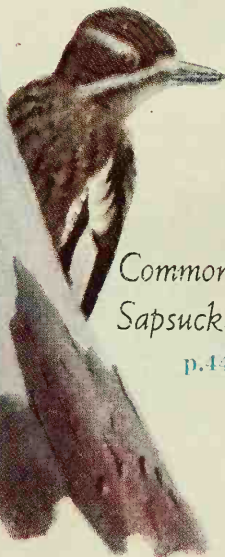
p.47



Downy Woodpecker

p.45

JUVENILE

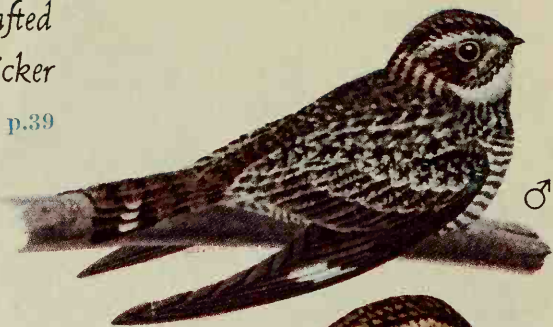


Common Sapsucker

p.44

Red-shafted
Flicker

p.39



Common Nighthawk

p.27

Mexican
Woodpecker

p.46



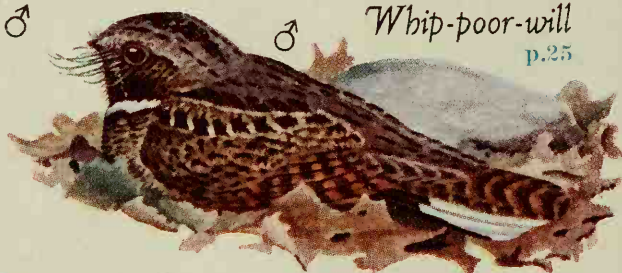
Poorwill

p.26



Trilling
Nighthawk

p.28



Whip-poor-will

p.25



Chuck-will's-widow ♂

p.24



Pauraque

p.27

Belted Kingfisher

p.35



ADULT

Cedar
Waxwing

p.132

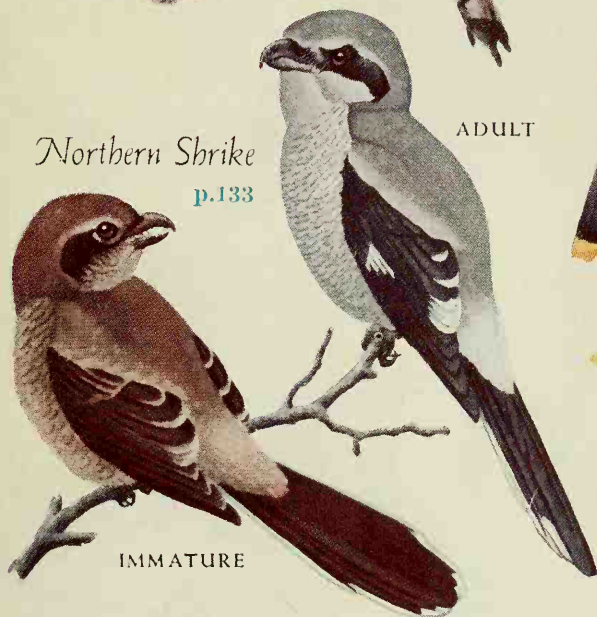


JUVENILE

Northern Shrike

p.133

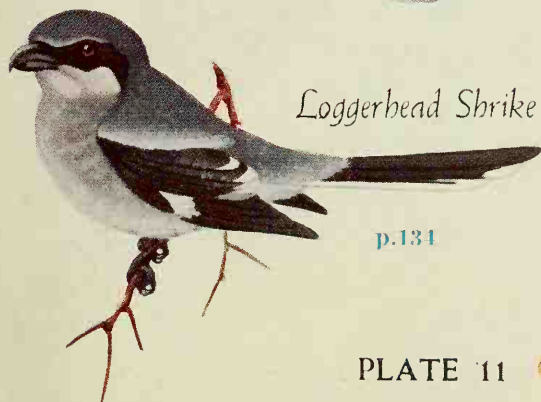
ADULT



IMMATURE

Loggerhead Shrike

p.134

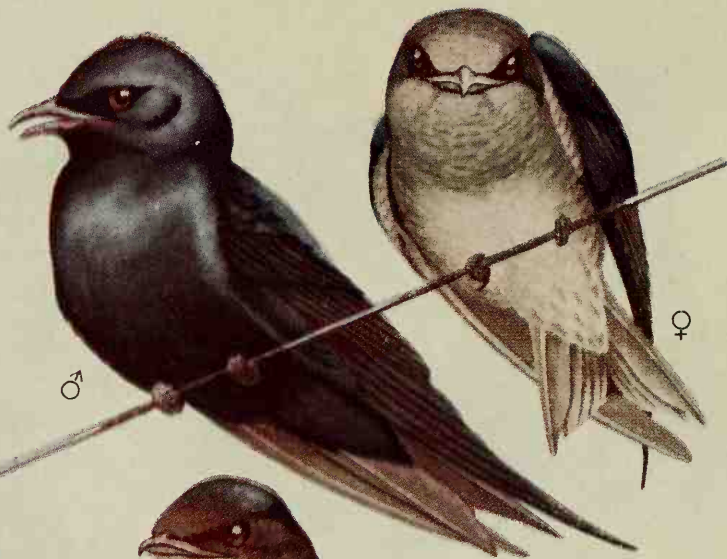


Bohemian
Waxwing

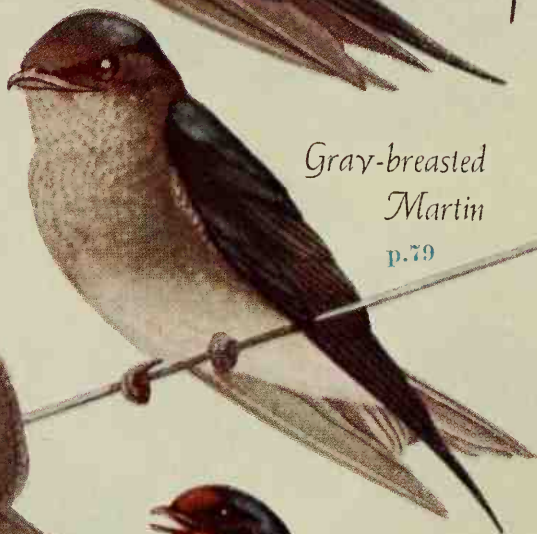
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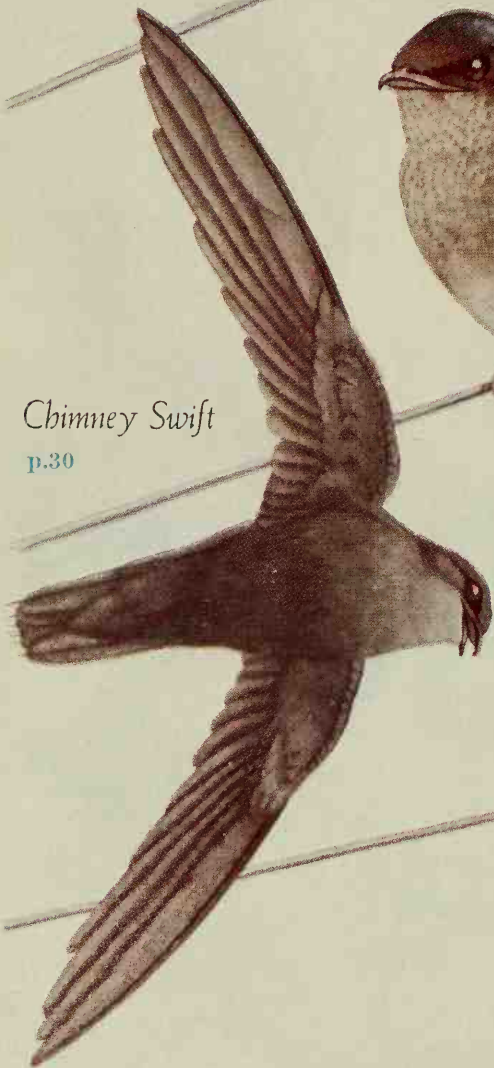
Purple Martin
p.78



Gray-breasted Martin
p.79



Chimney Swift
p.30



Barn Swallow
p.75



Rough-winged
Swallow

p.74



Bank Swallow

p.73



Bahama Swallow

p.71



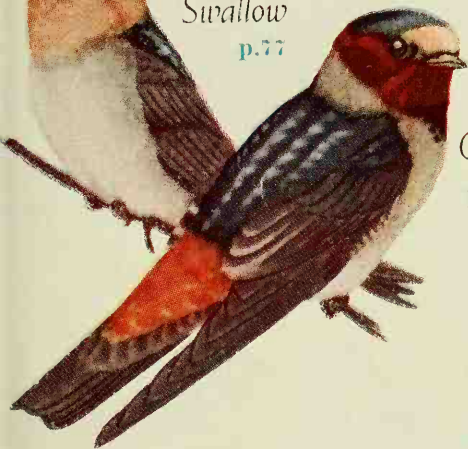
Cave
Swallow

p.77



Cliff Swallow

p.76



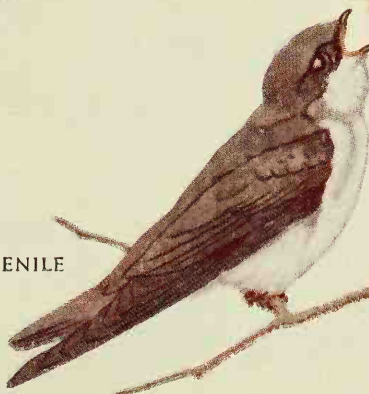
Tree Swallow

p.72



ADULT

JUVENILE

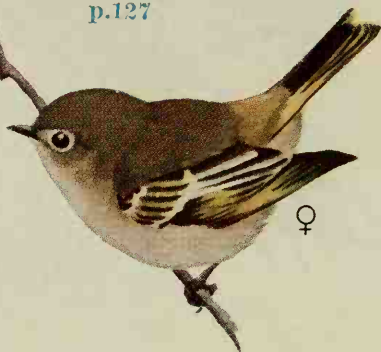


Golden-crowned
Kinglet
p.126



♂

♂ Ruby-crowned Kinglet
p.127



♀

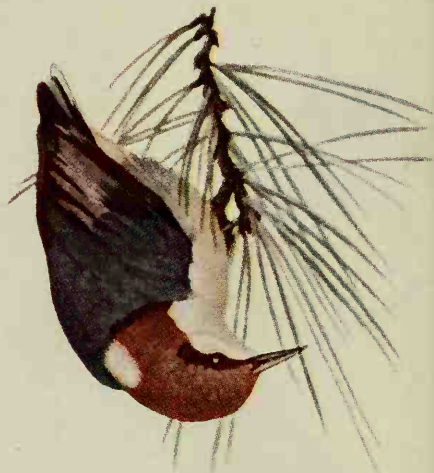


♀

White-breasted
Nuthatch
p.94



Brown-headed Nuthatch
p.96



Red-breasted
Nuthatch
p.95

Black-crested
Titmouse

p.93



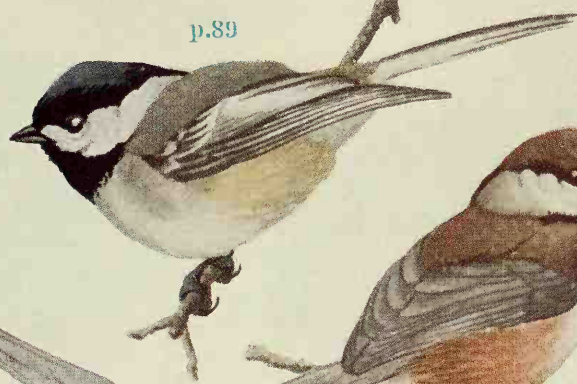
Tufted Titmouse

p.92



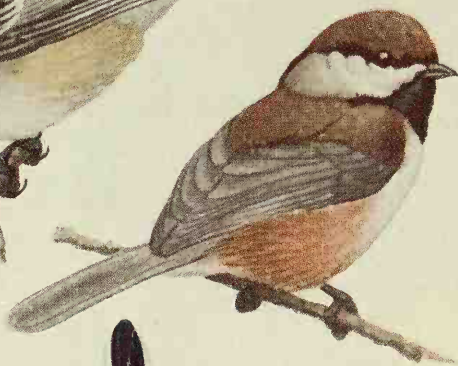
Black-capped Chickadee

p.89



Carolina
Chickadee

p.90



Brown-capped
Chickadee

p.91



Brown
Creeper

p.97



Blue-gray
Gnatcatcher

p.125

Brown
Thrasher
p.109



Mockingbird
p.107



Curve-billed
Thrasher
p.111



Long-billed Thrasher p.110



Cactus
Wren
p.102



Sage
Thrasher
p.111



JUVENILE



Robin
p.112



Catbird
p.103



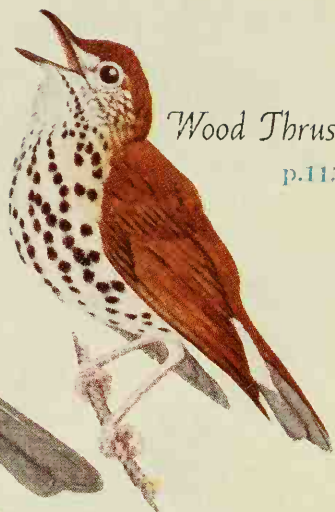
Veery

p.119



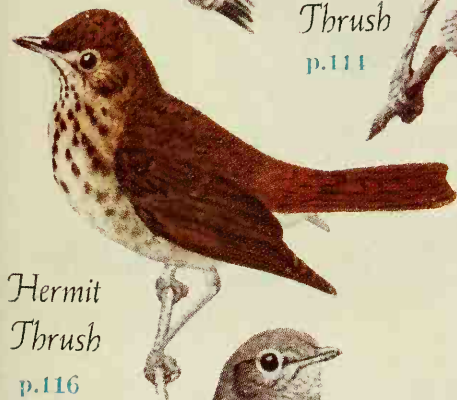
Wood Thrush

p.115



Gray's
Thrush

p.111



Hermit
Thrush

p.116

Olive-backed
Thrush

p.117



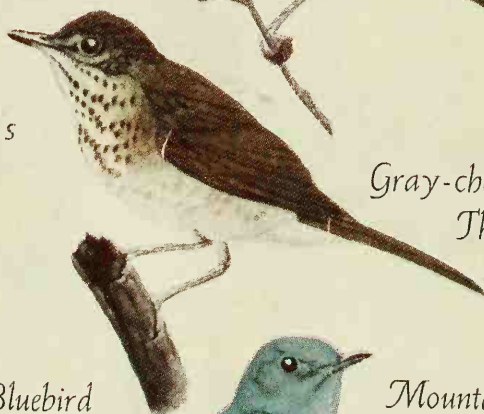
Townsend's
Solitaire

p.124



Gray-cheeked
Thrush

p.118



p.121
Eastern Bluebird



♂

Mountain
Bluebird

p.122



♂

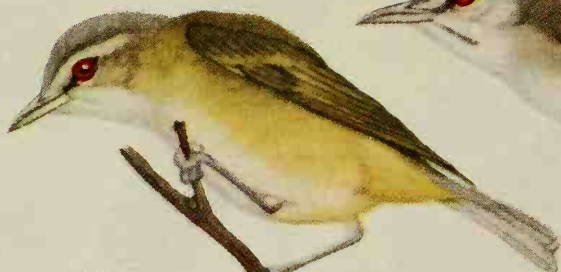
♀



♀

p.142

Yellow-green Vireo



p.141

Black-whiskered
Vireo

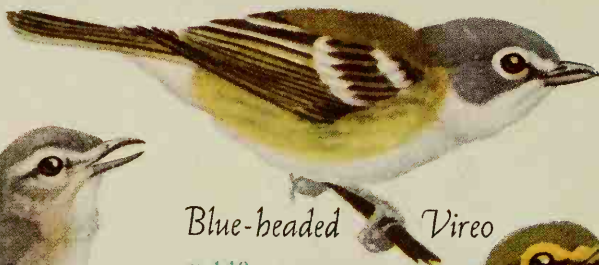


Black-capped Vireo

p.137



Red-eyed
Vireo
p.142



Blue-headed Vireo
p.140



Warbling Vireo

p.145



p.139

Yellow-throated Vireo

Philadelphia
Vireo

p.144



White-eyed
Vireo

p.137

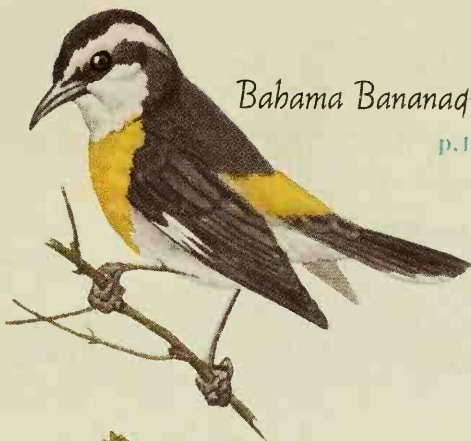
Bell's Vireo

p.138



Bahama Bananaquit

p.146



Wilson's Warbler

p.190



Yellow Warbler

p.161



♂ SPRING



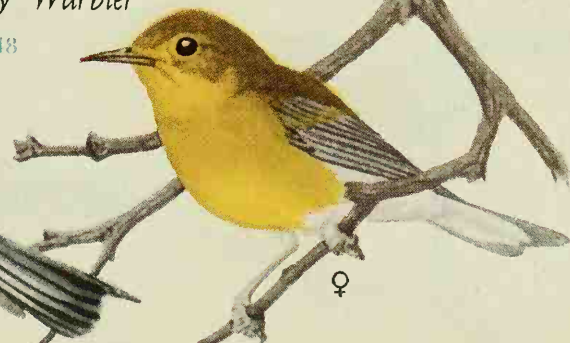
IMMATURE

♀



Prothonotary Warbler

p.148



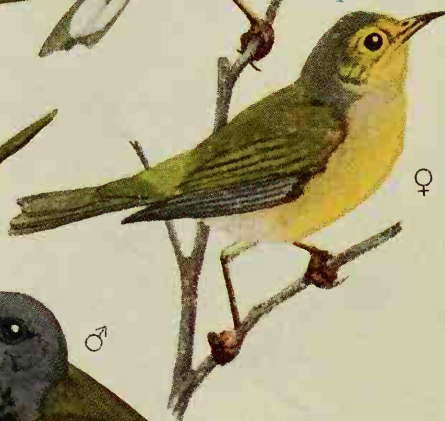
Macgillivray's
Warbler

p.186



Bachman's
Warbler

p.155



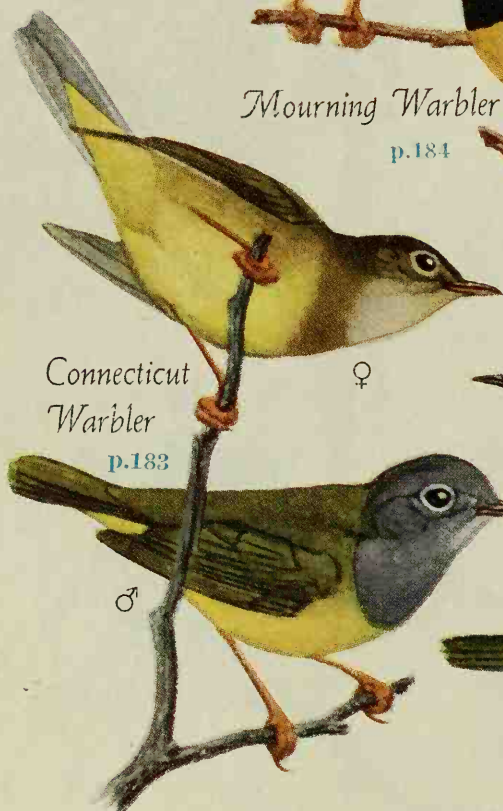
Mourning Warbler

p.184



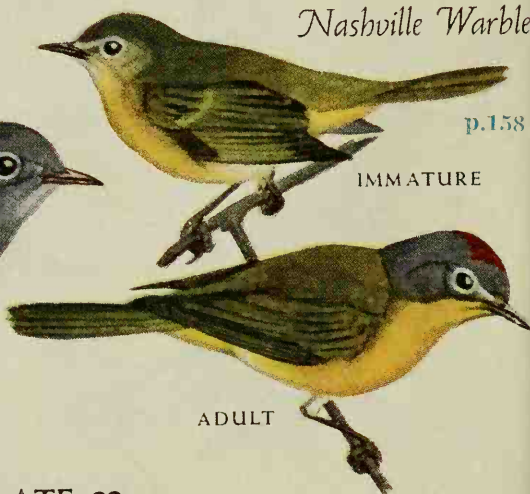
Connecticut
Warbler

p.183

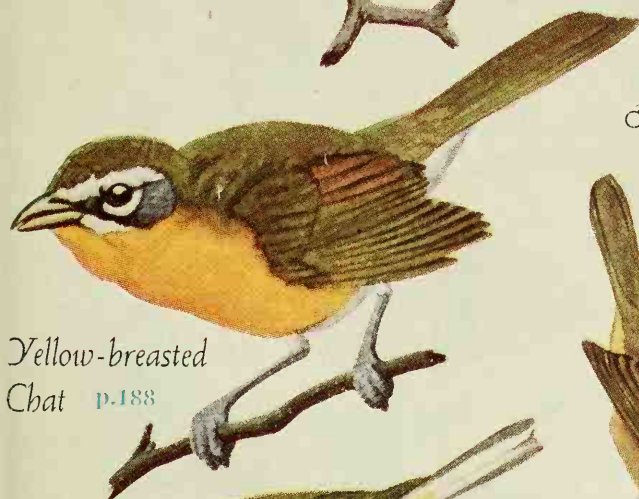


Nashville Warbler

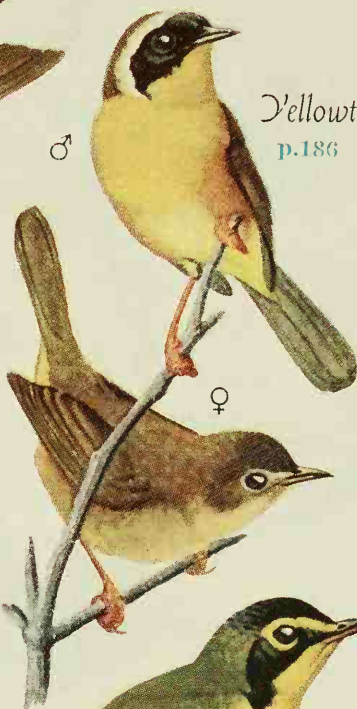
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Mexican
Ground-Chat
p.187



Yellow-breasted
Chat p.188



Yellowthroat
p.186



Hooded Warbler p.189



Kentucky Warbler
p.183



LAWRENCE TYPE

Hybrid
Variations
p.152

BREWSTER TYPE

Golden-winged
Warbler
p.150

p.151

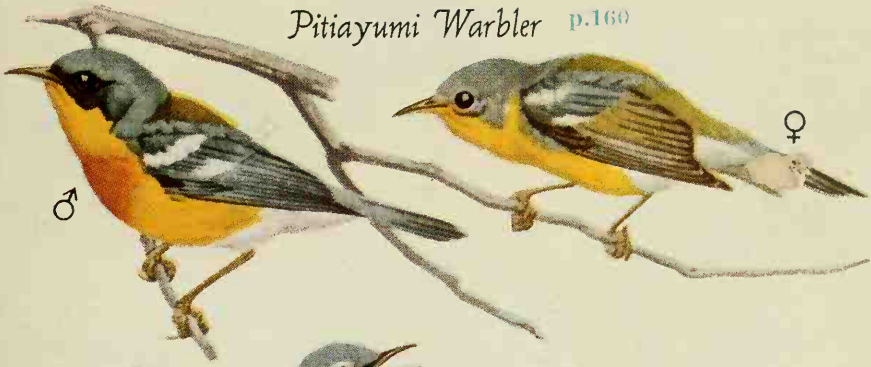
Blue-winged Warbler

Kirtland Warbler
p.177

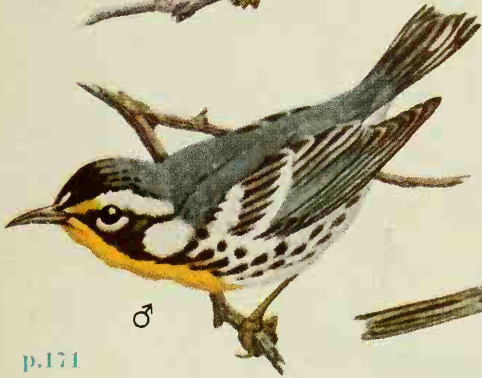
Canada Warbler

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Pitiayumi Warbler p.160



Parula Warbler p.159



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Yellow-throated Warbler



p.171

Sutton's Warbler

Cerulean Warbler p.169



Blackburnian
Warbler

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SPRING ♂

Magnolia Warbler

p.162



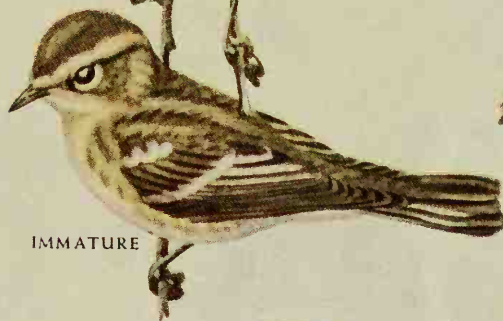
SPRING ♂



♀



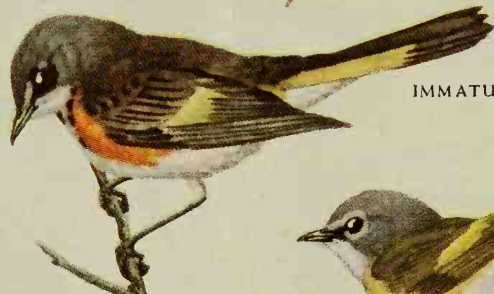
♀



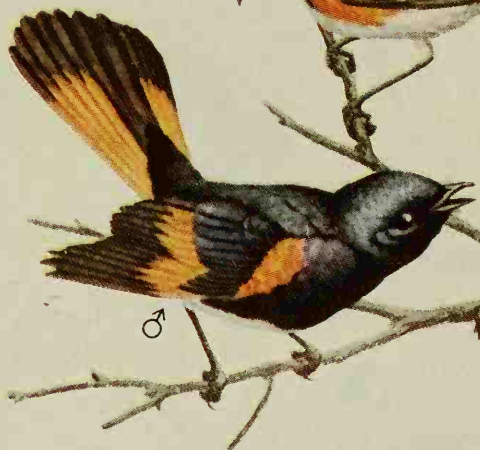
IMMATURE



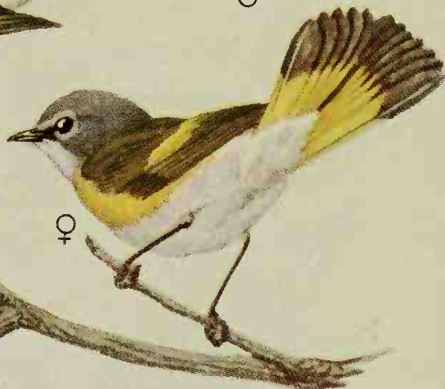
IMMATURE



IMMATURE ♂



♂



♀

Redstart p.192

*Audubon's
Warbler*
p.165



SPRING

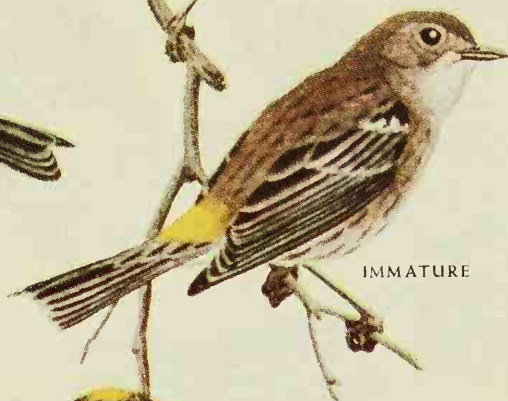
Myrtle Warbler
p.164



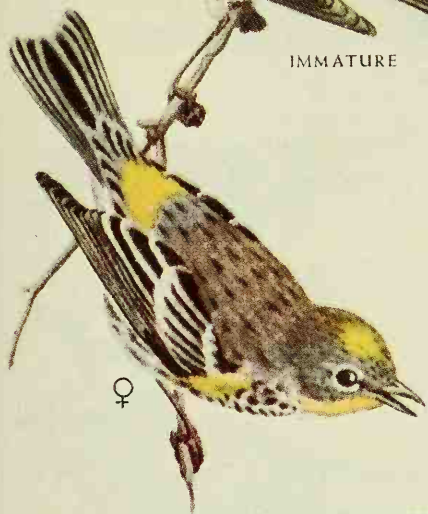
SPRING ♂



IMMATURE



IMMATURE



♀

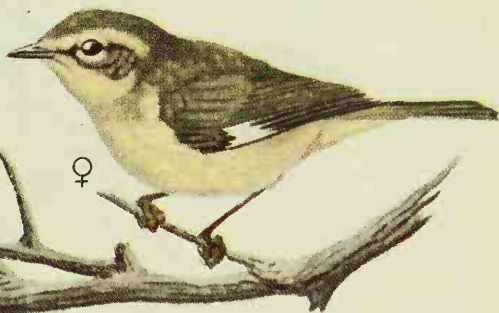


♀



♂

*Black-throated
Blue Warbler*
p.164



♀

Cape May Warbler

p.163

SPRING ♂

♀

SPRING ♂

IMMATURE ♀

♀

IMMATURE

p.173

Chestnut-sided Warbler

SPRING ♂

♀

IMMATURE

♂

Black-throated Green Warbler

p.167

Golden-cheeked Warbler

p.168

IMMATURE

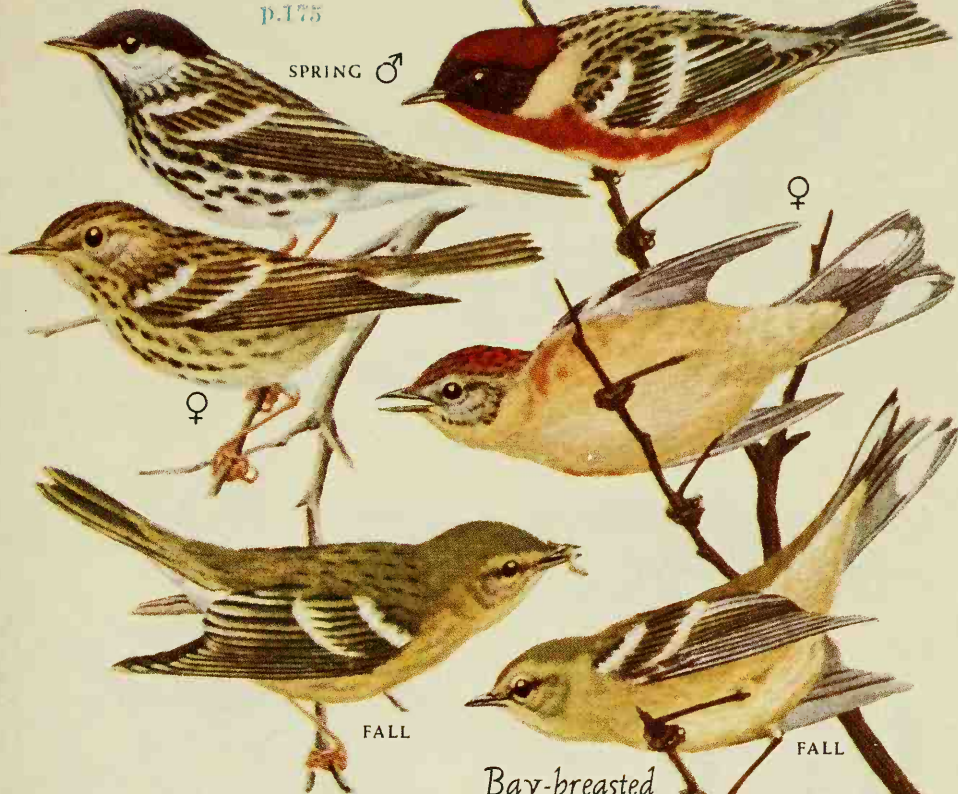
♀

Blackpoll Warbler

p.175

SPRING ♂

SPRING ♂



Bay-breasted Warbler

p.174

Black-throated Gray Warbler

p.166

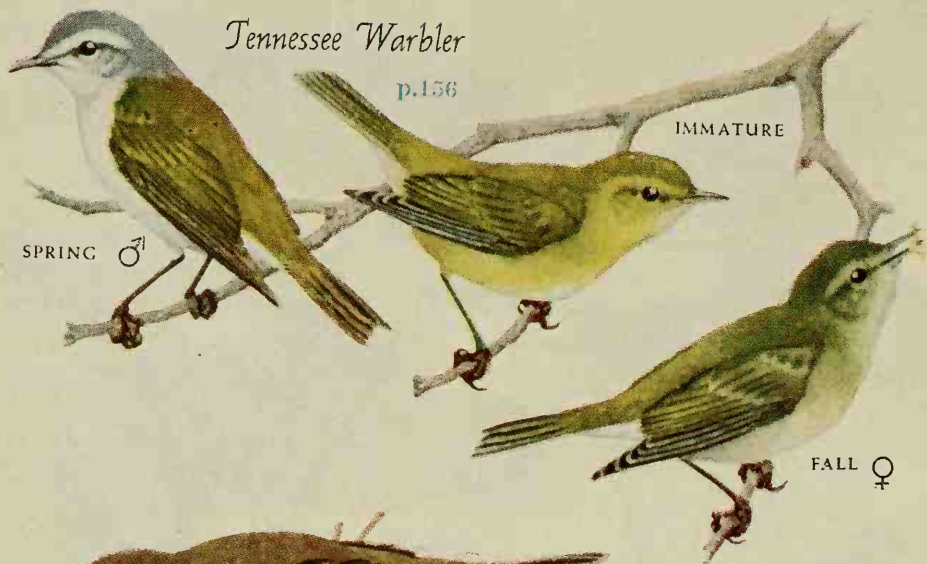


Black and White Warbler

p.147

Tennessee Warbler

p.156



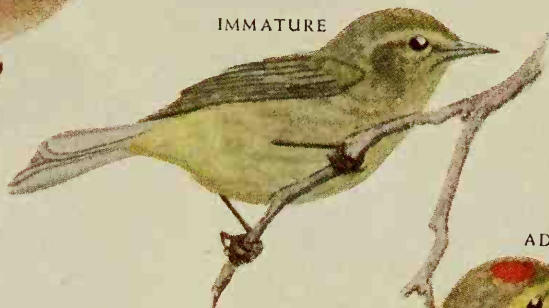
SPRING ♂

IMMATURE

FALL ♀



IMMATURE



IMMATURE



♂



ADULT

Pine Warbler

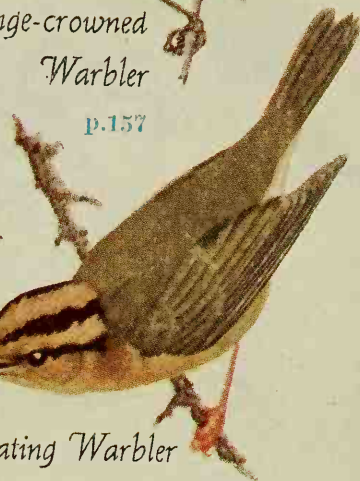
p.176

Orange-crowned Warbler

p.157

Swainson's Warbler

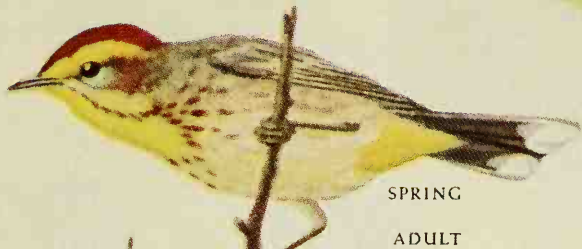
p.148



Worm-eating Warbler

p.149

Palm Warbler p.179



SPRING
ADULT



IMMATURE



p.178

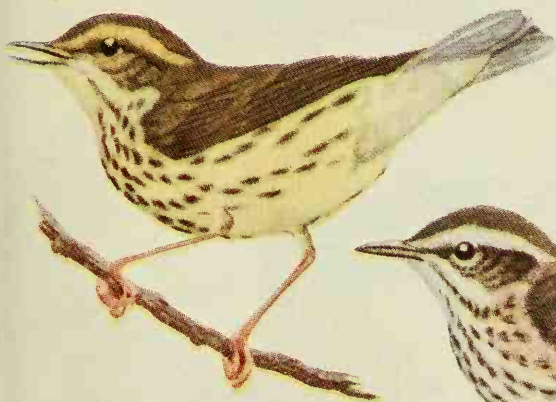
Prairie Warbler



IMMATURE



Ovenbird
p.180



Northern Water-thrush
p.181



*Louisiana
Water-thrush*
p.182

Rusty Blackbird

p.205

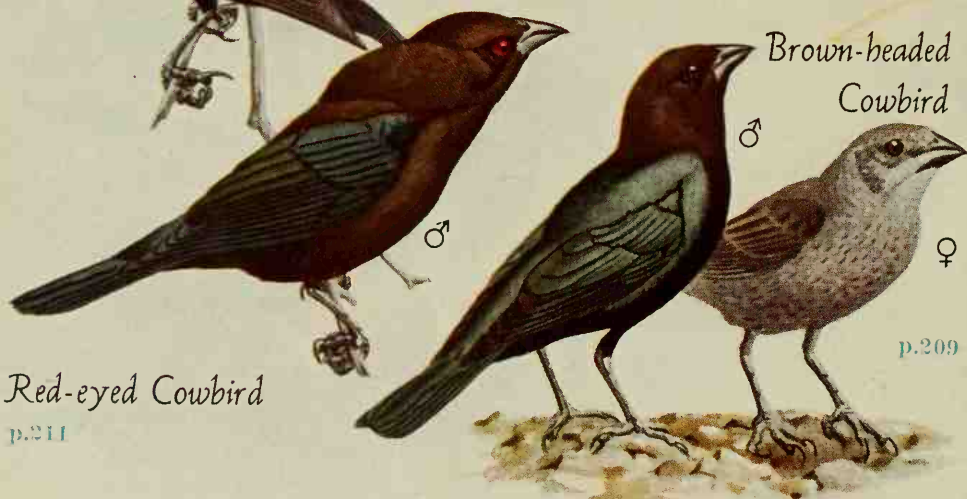


Brewer's Blackbird

p.206



Brown-headed Cowbird

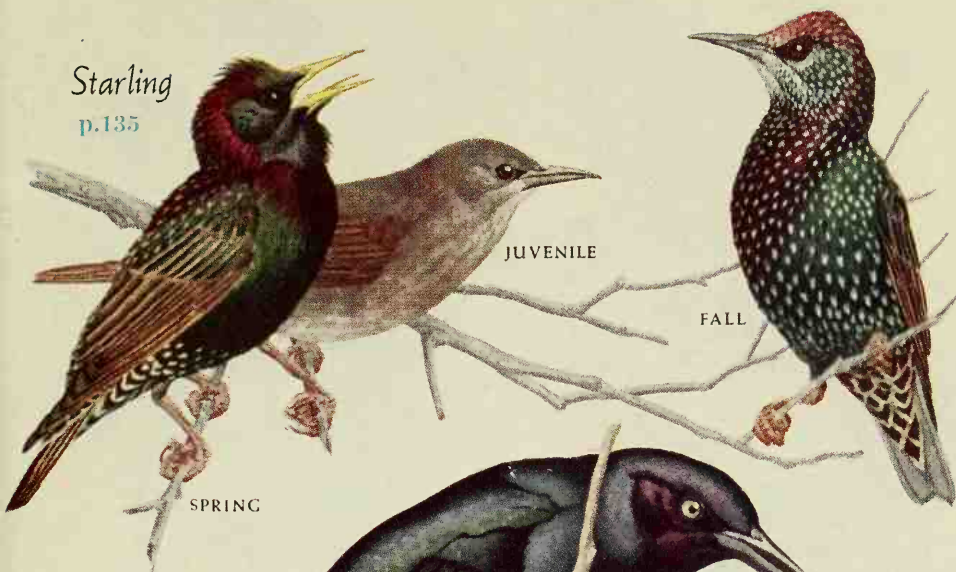


Red-eyed Cowbird

p.211

Starling

p.135



Boat-tailed
Grackle

p.207



Common Grackle

p.208

Yellow-headed
Blackbird

p.198



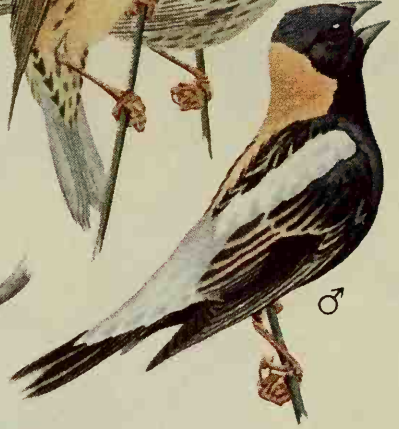
FALL



Bobolink

p.195

♀



IMMATURE ♂



Red-winged
Blackbird

p.199



Eastern
Meadowlark

p.196



Western
Meadowlark

p.197

Baltimore Oriole

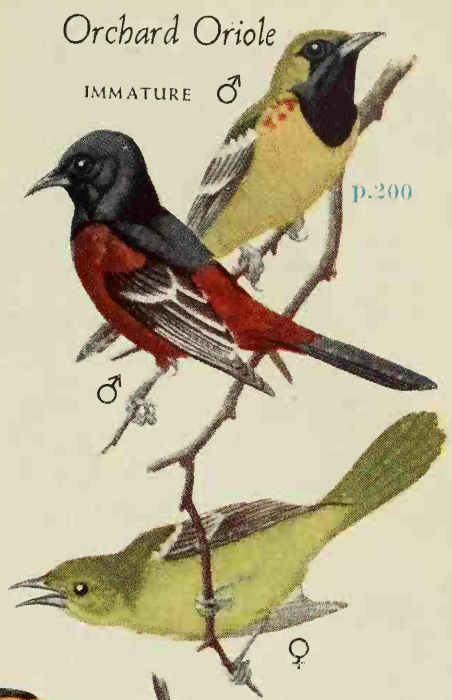
p.203



Orchard Oriole

IMMATURE ♂

p.200



IMMATURE ♀



Bullock's Oriole

p.204

Hooded Oriole

p.202



Tichtenstein's Oriole

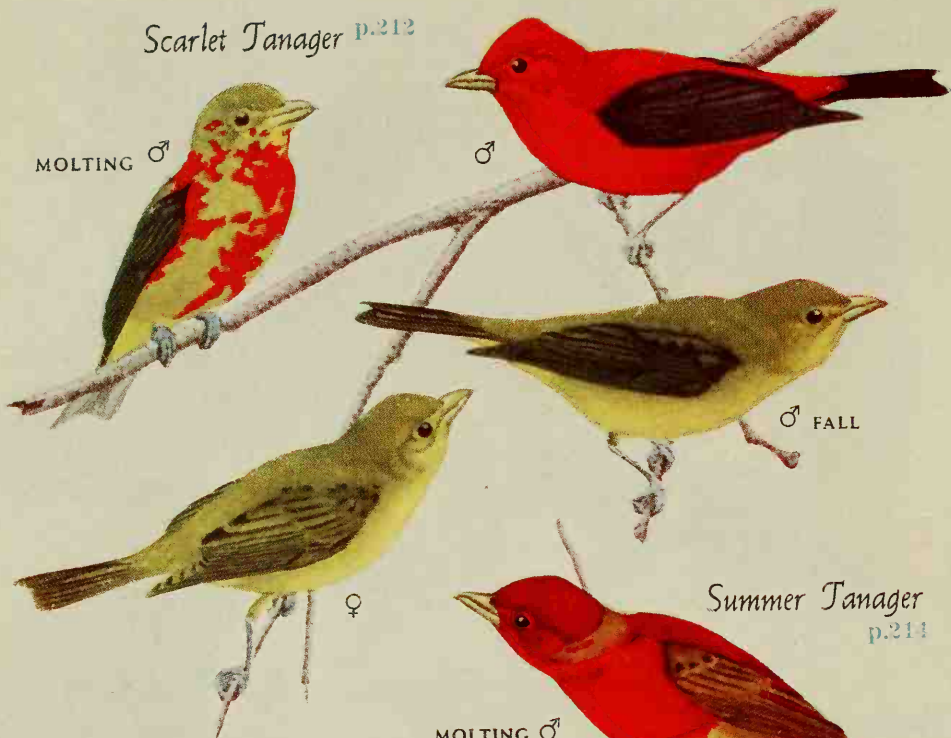
p.202



Black-headed Oriole

p.201

Scarlet Tanager p.212



Summer Tanager p.214



Western Tanager p.212





Cardinal

p.215

♂



p.216

Pyrrhuloxia



♂

♀



Spotted Towhee

p.240

♂

♀



Green-tailed
Towhee

p.238



Eastern
Towhee

p.239

♂

♀



Olive Sparrow

p.237

Rose-breasted Grosbeak

p.216



Blue Grosbeak

p.218



Evening Grosbeak

p.223



Pine Grosbeak
p.227

IMMATURE ♂

JUVENILE

Red Crossbill
p.235



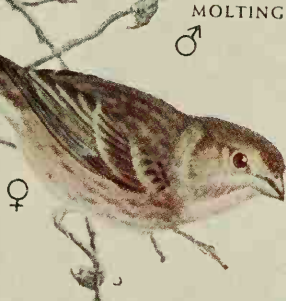
White-winged
Crossbill p.236

IMMATURE ♂

Indigo
Bunting
p.219



Painted Bunting
p.220

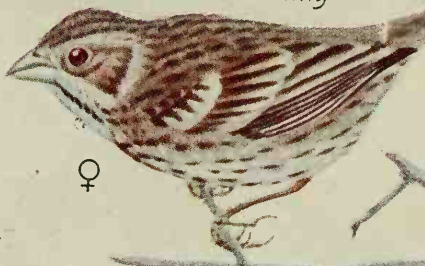


p.220

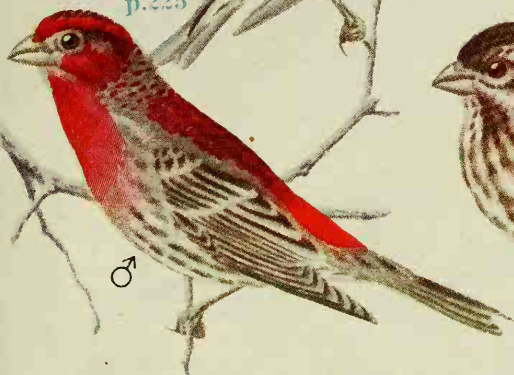
Varied Bunting



p.241
Lark Bunting

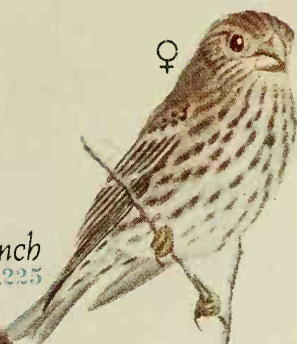


House Finch
p.225



♂

♀



Purple Finch
p.224



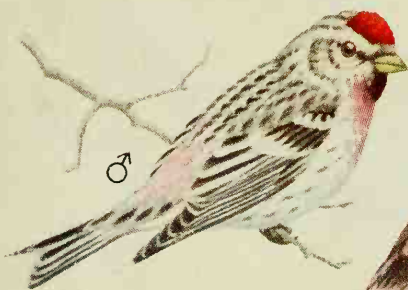
♂



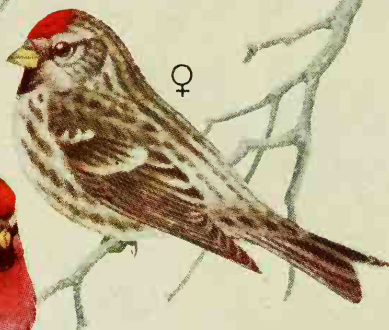
♀

♂

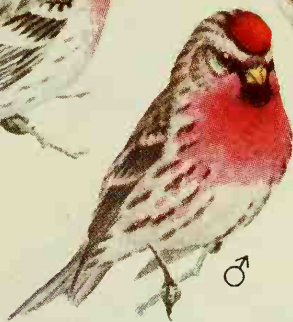
Hoary Redpoll
p.230



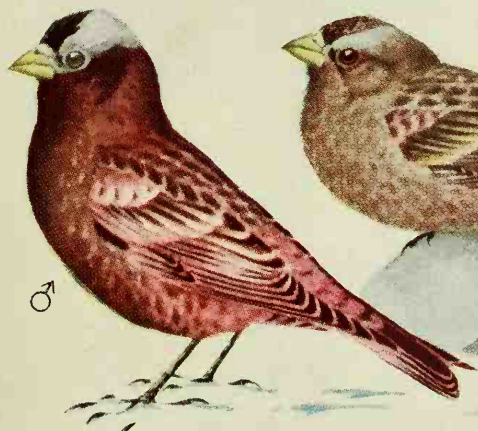
♀



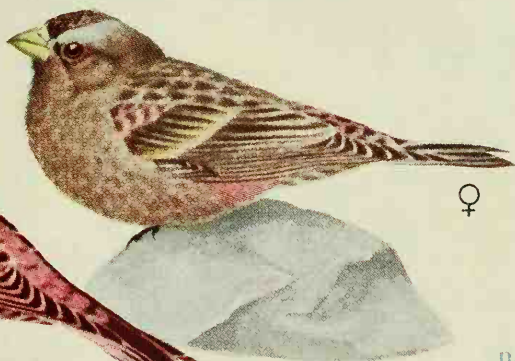
Common Redpoll
p.231



♂



♂



♀

p.228

Gray-crowned Rosy-Finch

Common
Goldfinch
p.233

♂ SPRING



SPRING ♀



♀ FALL



IMMATURE

♂



Dark-backed
Goldfinch
p.234

♂



♂ IMMATURE



♀



European
Goldfinch

p.229



Pine Siskin
p.232



European
Tree Sparrow
p.194

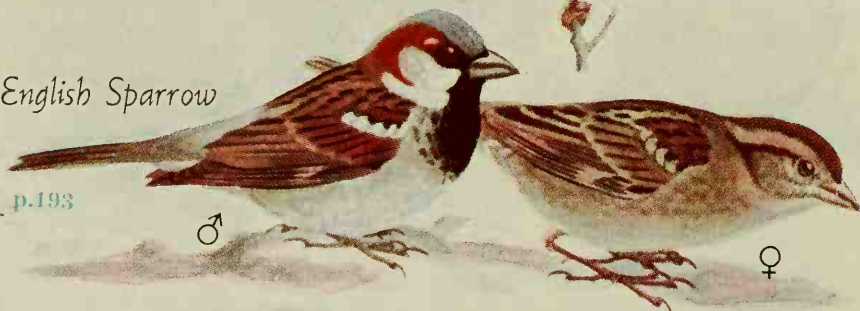


English Sparrow

p.193

♂

♀



White-throated Sparrow

p.267

IMMATURE

IMMATURE

ADULT

ADULT

White-crowned Sparrow

p.266

ADULT

IMMATURE

Harris's Sparrow

p.265

IMMATURE

SPRING

♂

IMMATURE

ADULT

Dickcissel

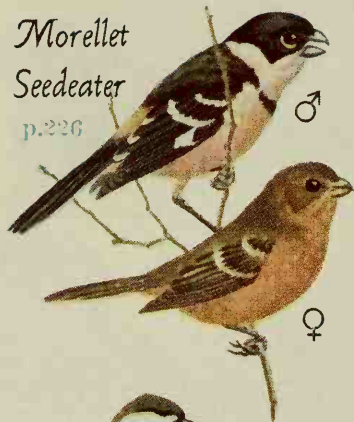
p.221

♀

Lark Sparrow

p.253

Morellet
Seedeater
p.226



Cassin's
Sparrow
p.256



Botteri's
Sparrow
p.256

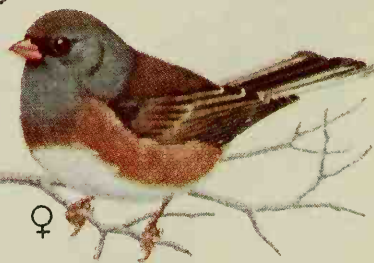
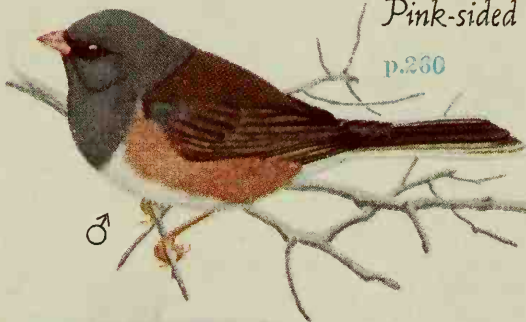
Black-throated
Sparrow
p.257



White-winged
Junco
p.258

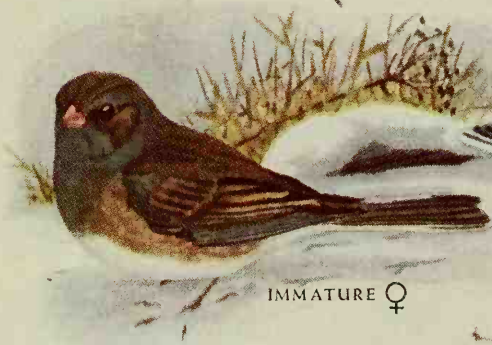


Pink-sided Junco
p.260



p.259

Slate-colored Junco



IMMATURE ♀





IMMATURE

Rufous-crowned
Sparrow

p.254



Pinewoods
Sparrow

p.255



ADULT



Tree
Sparrow

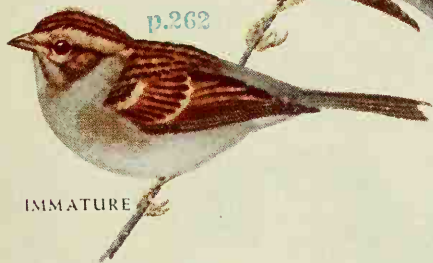
p.261



Chipping
Sparrow

p.262

ADULT



IMMATURE



Field Sparrow

p.264

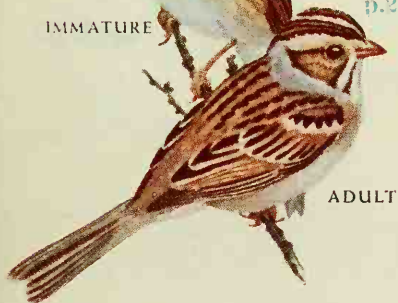
ADULT

Clay-colored
Sparrow

p.263



IMMATURE



ADULT



IMMATURE

Henslow's Sparrow

p.248



ADULT

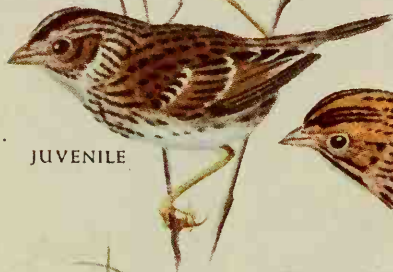
JUVENILE

p.245

Grasshopper Sparrow



ADULT



JUVENILE

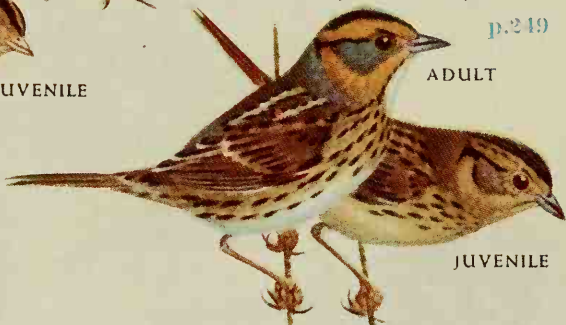
Baird's Sparrow

p.246



Sharp-tailed Sparrow

p.249



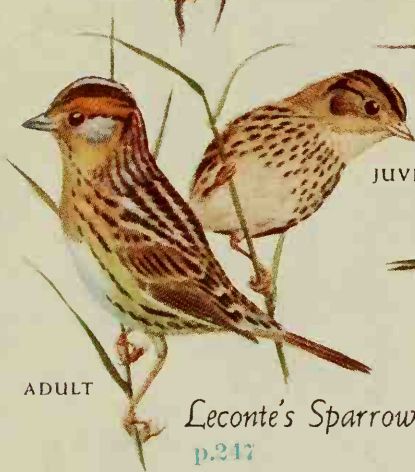
ADULT

JUVENILE

ADULT

Leconte's Sparrow

p.247



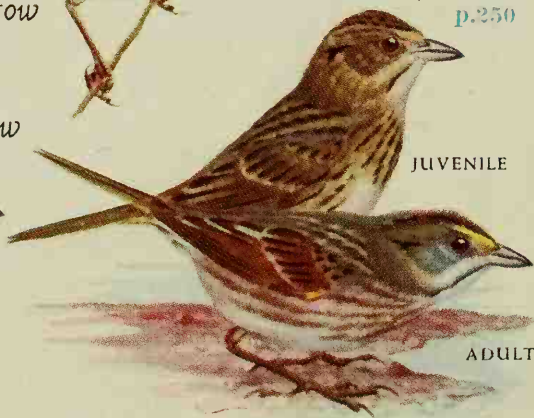
p.251

Cape Sable Sparrow



Seaside Sparrow

p.250



JUVENILE

ADULT

p.251

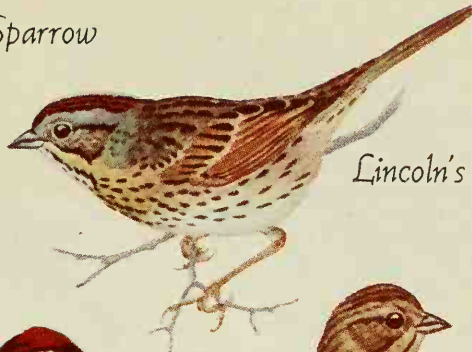
Merritt Island Sparrow





Song Sparrow

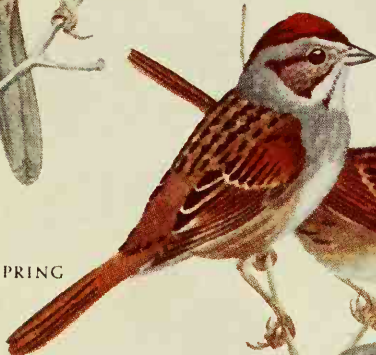
p.271



Lincoln's Sparrow

p.269

SPRING



FALL



JUVENILE



Swamp Sparrow

p.270



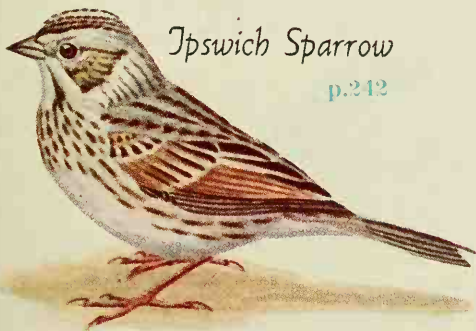
p.252

Vesper Sparrow



Fox Sparrow

p.268



Ipswich Sparrow

p.242



Savannah Sparrow

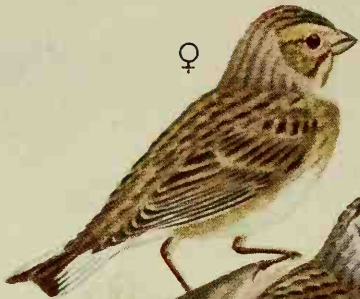
p.244

Chestnut-collared
Longspur
p.275

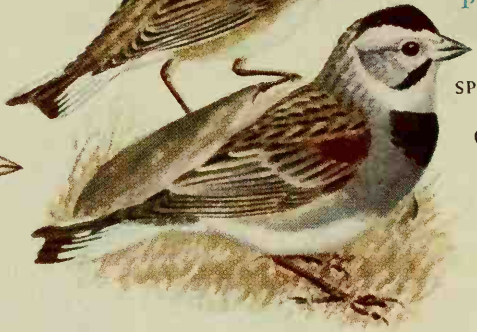


♂ SPRING

McCown's
Longspur
p.272



♀

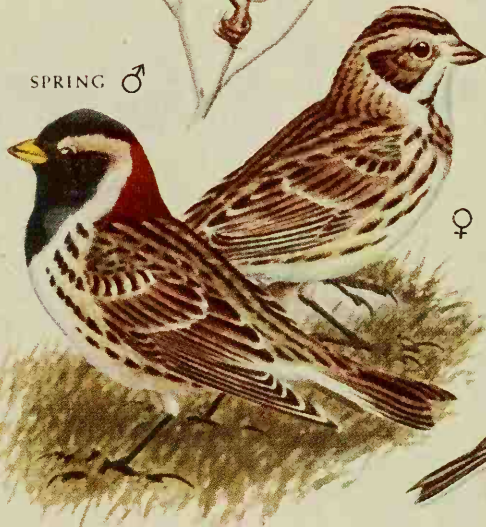


SPRING

♂

SPRING

♂



♀

Smith's Longspur
p.274



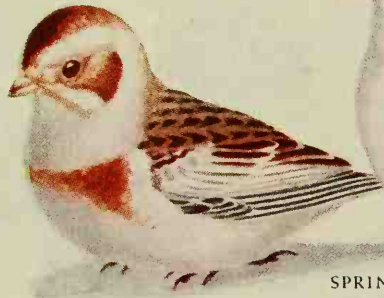
♀



SPRING

♂

Lapland Longspur
p.273



FALL ♀

Common Snow-bunting
p.276



SPRING

♂

nesting it becomes gregarious and is often considered a game bird. It feeds on insects and fruits. It is very fond of figs.

VOICE: Call, a robin-like *pup, pup, pup* but higher-pitched.

The song is richer than a robin's, almost like an oriole's.

NEST: Usually from 3 to 12 feet high, firmly supported without concealment in a small tree. Its construction is robin-like.

The 2 or 3 pale green-blue eggs (1.13 x .84) are thickly covered with fine rusty-brown dots.

RANGE: (R.) Occurs from extreme n.e. Mexico south to Panama. Has occurred as far north as the Rio Grande Valley.

Wood Thrush*

Hylocichla mustelina—#19

IDENTIFICATION: L. 8. The large round dark spots running onto the sides and flanks, and the head, which is brighter reddish-brown than the rest of the body, are distinctive. The bird is heavier-bodied than other thrushes.

HABITS: This thrush is found in greatest abundance in the low-lying, moister parts of deciduous woodlands with well-developed undergrowth, especially along streams, lake borders, and swamps, but it may occur almost anywhere in or near such woodlands. In many places it has invaded residential areas. It is found in the sections that are heavily shaded by tall trees, while the robin predominates in the sunnier, more open areas. Essentially a bird of the forest floor, the wood thrush seldom rises above the lower limbs of trees, even to sing. Much of its food is insects, the balance small fruits. Most food is obtained by scratching aside dead leaves on the ground.

VOICE: Alarm note, a sharp, rapid, liquid *pit, pit, pit, pit*. Calls a low *tuck, tuck* and other single notes. The clear, liquid, flutelike song is similar to a hermit thrush's, the songs of each going on and on without distinct beginning or end. The songs are nevertheless divided into short

phrases (3 to 5 notes in the case of the wood thrush) broken by pauses. More variation in pitch within a phrase occurs in this species; some notes are quite low. If near the bird, one finds many of the phrases concluded with a thin, high-pitched trill running off into a sputter.

NEST: From 5 to 12 feet up in dense shrubbery, in the crotch or fork of a sapling or saddled onto the horizontal lower limb of a larger tree; made of stems and leaves cemented to an inner cup of mud or hardened leafmold lined with rootlets. The 4 unmarked greenish-blue eggs (1.02 x .72) average a little darker than a robin's.

RANGE: (M.) Breeds from c. New Hampshire, s.e. Ontario, c. Wisconsin, and s. South Dakota south to n. Florida, Louisiana, and e. Texas. Winters from s. Mexico south to w. Panama.

Hermit Thrush*

Hylocichla guttata—#19

IDENTIFICATION: L. 7. The reddish-brown tail contrasting strongly with the rest of the upper parts is distinctive in any plumage, but the bird should not be confused with the reddish-tailed fox sparrow. Note that when disturbed the hermit thrush has a habit of slowly raising its tail.

HABITS: The hermit thrush inhabits areas ranging from low wooded swamps to dry hillsides and uplands, from dense, cool woodlands to rocky brush-grown pastures and recently cut- or burned-over forests. Generally the birds are associated with conifers, but in a few areas they occur in deciduous woodlands with only a sprinkling of pine or hemlock. Because of its habitat tolerance it is a common bird over a wide area. Its food is insects and berries. Most of the insects it takes on the ground among dead leaves. In fall and winter its diet becomes preponderantly vegetarian.

VOICE: Call notes, a low *chuck*, plus a mewing note and several others when on breeding grounds. The song is com-

posed of a series of ethereal bell-like cadences of great beauty. The long, low, flutelike opening note is followed by up to a dozen shorter, thinner notes varying slightly in pitch, and run together in groups to give a tremolo effect. As the cadences continue, the openings tend to go so high as to approach the limit of audibility. The song may be delivered from a fixed treetop perch or from near, if not on, the ground. The song varies so in volume that the bird's distance is difficult to estimate.

NEST: Usually on the ground on a low knoll or hummock, occasionally in a low tree; a compact cup of moss, plant fibers, leaves, and rootlets. The 4 green-blue eggs (.85 x .65) are unmarked.

RANGE: (P.M.) Breeds from s. Labrador, n. Ontario, n.c. Saskatchewan, s.w. Mackenzie, and s.c. Alaska south to Long Island, New York, Virginia (mts.), n. Michigan, c. Minnesota, c. Saskatchewan, New Mexico, and n. Lower California. Winters from Massachusetts, Pennsylvania, s. Missouri, and Washington south to c. Florida and Guatemala.

Olive-backed Thrush*

Hylocichla ustulata—#19

IDENTIFICATION: L. 7. This and the gray-cheeked are similar thrushes with uniformly colored grayish-brown or olive-brown backs. In good light the olive-backed can usually be distinguished by its broader buffy eye ring and the buffier color of its cheeks, throat, and breast.

HABITS: This is a dominant bird over vast areas of spruce-fir forest. Populations are highest in low, damp areas near water and in stands of young conifers mixed with deciduous trees like birch, but it commonly ranges throughout the mature forest. Occasionally the bird may be found in low, deciduous growths with only a few scattered conifers. Like most small land birds, these thrushes migrate during the hours of darkness, and on still nights their mellow, sweet-

toned whistles often fill the sky for hours. Insects are their basic food, but they are fond of wild fruits. They feed both in the foliage and on the forest floor and fly-catch as well.

VOICE: Call notes are an abrupt *whit* and a high-pitched *peep*. The throaty, gurgling song lacks the richness of the wood thrush's and the purity of the hermit's but is pleasantly musical. The bird repeats similar phrases, broken occasionally by a call note. Each phrase starts low and mounts in pitch through 12 or so paired (second note lower) but connected notes; occasionally the last few pairs are on the same pitch.

NEST: Well sheltered and firmly supported, 3 to 15 feet high in a small tree or shrub, usually evergreen. The neatly built nests are often notable for the large amount of moss or lichen worked in with the twigs, fern stems, sedges, leaf skeletons, and other fibrous materials. In some regions mud and wet leaf mold form the inner cup. The 3 or 4 pale greenish-blue eggs (.90 x .65) are evenly marked with light brown.

RANGE: (M.) Breeds from Newfoundland, c. Quebec, n. Manitoba, n.w. Mackenzie, and n.w. Alaska south to n. New England, West Virginia (mts.), n. Michigan, Colorado, and s. California. Winters in South America south to Argentina.

Gray-cheeked Thrush*

Hylocichla minima—#19

IDENTIFICATION: L. $7\frac{3}{4}$. (Southern birds $6\frac{3}{4}$.) Separated from the olive-backed only by gray instead of buffy cheeks, much less buffy under parts, and the absence of a distinct eye ring. Call notes are the best way to tell the species apart.

HABITS: This, the most northerly of American thrushes, inhabits the boreal forest where tamarack and black spruce dominate and ranges through the stunted growth of the tree-line zone into the open tundra wherever dwarf wil-

lows or birches maintain a foothold. In the East it ranges south in wind-swept coastal areas and mountaintops where the spruce-fir forest is stunted by weather conditions. In migration it is found near the ground in shady woodlands or shrubbery. In fall, like all thrushes, it takes wild fruits to supplement its insect diet.

Like other essentially eastern birds, gray-cheeks, in response to suitable habitats, have extended their breeding range far to the northwest; those nesting in eastern Siberia now fly east over some 105 degrees of longitude before turning south to their winter home.

VOICE: The common call is a downward-slurred, nighthawk-like *queep* much longer than the olive-backed's abrupt *peep*. The song, occasionally heard from migrants, is a weak even-pitched series of downward slurred notes interspersed with short lower notes. It is veery-like but runs up the scale toward the end, not down.

NEST: From near or on the ground up to about 20 feet, depending upon the height of the local vegetation. The firmly lodged nest is a compact cup of woven sedges, other fibers, and decayed leaves cemented by mud. The 3 to 5 greenish-blue eggs (.92 x .67) are finely, often faintly, marked with brown dots.

RANGE: (M.) Breeds from n. Newfoundland, n. Labrador, n. Manitoba, n.w. Mackenzie, n. Alaska, and n.e. Siberia south to s.e. Quebec, mountaintops of s.e. New York, n. Ontario, n.c. Manitoba, n. Alberta, n. British Columbia, and c.s. Alaska. Winters in Hispaniola and across n. South America.

Veery*

Hylocichla fuscescens—#19

IDENTIFICATION: L. 7. The uniformly tawny-brown upper parts and the faintly spotted pale buffy breast set this bird apart from other thrushes. In juvenile plumage the upper parts of all the thrushes are streaked or spotted with a

lighter color. The juvenile wood thrush is spotted chiefly on the head, while in the veery all upper parts are spotted with tawny-olive. The gray-cheeked and olive-backed juveniles are finely streaked above, but the gray-cheeked has a buffier and much narrower eye ring.

HABITS: The veery prefers wooded areas open enough to encourage a fairly dense undergrowth of shrubs or ferns. Willow and alder swamps, lowland areas bordering streams and lakes, and thickets of deciduous second growth are other favored haunts, though at times the bird may be found on dry, brushy hillsides. It is characteristic of northern deciduous and southern coniferous forests where openings have stimulated deciduous shrubs and birches. Veeries obtain most of their insect food by scratching in the leaf mold of the forest floor. Nearly half their food appears to be wild fruit and seeds.

The common calls of the veery and other thrushes are easy to imitate well enough to get the birds to answer. Usually by imitation or by squeaking on the back of one's hand any thrush can be lured out of the bushes.

VOICE: The call note is an easily imitated whistled *phew* falling in pitch. The song is a rolling series of half a dozen falling or downward-slurred muffled notes, each weaker and lower than the preceding, delivered in a thin, vibrant whistle that gives it a faraway, wild, remote sound.

NEST: Commonly on the ground, often worked into the center of a fern tussock or other thick vegetation or on a log or stump; occasionally in a shrub or low tree. The bulky cup is made of leaves, moss, and fibers which become finer toward the center. The 4 greenish-blue eggs (.85 x .67) are unmarked.

RANGE: (M.) Breeds from Newfoundland, s. Quebec, s. Ontario, s. Manitoba, c. Alberta, and s. British Columbia south to New Jersey, n. Georgia (mts.), n. Indiana, c. Iowa, n. New Mexico, Utah, Nevada, and c. Oregon. Winters in South America south to Brazil.

Eastern Bluebird

Sialia sialis—#19

IDENTIFICATION: L. 7. The bright blue and reddish-brown male is unmistakable. The female is bright blue only on the wings and tail and is a duller brown below. The blue is very restricted in juveniles, and below they are white mottled with gray.

HABITS: This is a bird of open country with scattered trees. It seems especially attracted to orchards, but it occurs wherever wooded areas have been opened up by lumbering, fire, or flood. In most regions it could be more abundant if more nest sites were available. Suitable sites are scarce, and bluebirds now have to share them with two aggressive rivals from Europe, the starling and the English sparrow, as well as with the native tree swallow and house wren. It has been repeatedly demonstrated that marked increases in the bluebird population can be produced by community birdhouse campaigns. An entrance hole less than $1\frac{1}{2}$ inches in diameter excludes starlings, and a location no higher than a fence post discourages English sparrows. Since the bluebird requires considerable territory, boxes should not be placed too close together.

The bluebird's diet averages about two-thirds insect to one third fruit. Grasshoppers, crickets, beetles, and caterpillars are the most important insects, many of them captured on the ground. In winter bayberry, poison-ivy, and sumac berries are important.

VOICE: The *cher-wee* call, uttered at frequent intervals even when the bird is in flight, is a sweet, liquid series of 2 or 3 notes. It carries well and is often the first indication of the presence of bluebirds. The plaintive song is a rapid series of soft, single, and slurred double *cheuery* notes with a slight variation in pitch. Often 2 variations are sung alternately.

NEST: In natural tree cavities, old woodpecker holes, and bird boxes at heights of from 2 to 25 or 30 feet; a loose

cup of grasses and stems. The 4 to 6 pale blue eggs (.82 x .64) are unmarked; 2 broods are reared.

RANGE: (P.M.) Breeds from Newfoundland, s. Quebec, n. Ontario, and s. Manitoba south to s. Florida, the Gulf Coast, and Honduras; west to e. Montana, e. Colorado, w.c. Texas, s. Arizona, and Sinaloa. Winters from s. New England and s. Michigan south.

Mountain Bluebird

Sialia currucoides—#19

IDENTIFICATION: L. $7\frac{1}{4}$. The pale cerulean or turquoise male is distinctive even in winter, when much of the body blue is obscured by gray-brown feather margins and tips. The buff-gray female, dark above, light below, is blue only in the tail region and on the wings. Juveniles are similar but generally blue only on tail and flight feathers.

HABITS: The mountain bluebird is widely distributed, inhabiting open areas wherever trees are available for nesting and perching. From just below the timber line in high mountains it ranges down to the foothills and pine-covered ridges of the plains and in some areas to the cottonwood groves about prairie ranch buildings. In the North it seems to be spreading eastward as a breeder, and in winter it regularly wanders east of its normal breeding range. Its food is chiefly insects, captured by pouncing from a prominent lookout perch or as the bird hovers over an open area, the prey being seized in a quick drop to the ground. In winter the birds eat many wild fruits.

VOICE: This is a remarkably silent bird, although flocks in flight sometimes give a low *terr* call. The song appears to start in darkness and stop at daybreak. It is said to be like a robin's carol given in the gentle tones of a bluebird.

NEST: In natural cavities in trees or in abandoned woodpecker holes, bird boxes, or crevices about cliffs and buildings; from close to the ground to 25 or more feet high. The nest

is loosely constructed of plant debris. The 5 or 6 pale blue eggs (.86 x .65) are unmarked; 2 broods are reared.

RANGE: (P.M.) Breeds from s.c. Manitoba, c. Saskatchewan, n.w. British Columbia, and s. Yukon south to Chihuahua, and from w. Nebraska west to the Cascades and Sierra Nevadas. Winters from Colorado and Oregon south through n. Mexico and east to Kansas and e.c. Texas.

Northern Wheatear

Oenanthe oenanthe—#17

IDENTIFICATION: L. $6\frac{1}{4}$. The dark wings, white rump, and distinctive tail pattern, all conspicuous in flight, are the best field marks. In summer the black-winged male becomes grayer above and whiter below. The forehead and the line over the eye are white, lores and ear coverts black. The summer female is intermediate, dark brown instead of black and buff instead of white, except in the tail area.

HABITS: The northern wheatear is a bird of bare hillsides, stony barrens, sand dunes, and other wastelands, generally observed on or flying close to the ground. At rest it is a bullheaded, short-tailed bird. It likes to perch on stones and clods, standing upright on its long legs, bobbing and waving its tail up and down. It moves rapidly on the ground by long hops. Although it eats seeds and fruits, its food is chiefly insects, many of which are caught by fluttering dashes into the air. Wheatears also search the edges of mud flats and wet places for small crustacea and mollusks.

This species has colonized the American Arctic from both the east and west: only about 1,000 miles now separate the 2 groups. Each year in migration the birds retrace the route over which their ancestors spread out from their original European and Asiatic homes. Thus some of them fly over almost as many degrees of longitude before turning south to their wintering grounds as do the gray-cheeked thrushes of Siberia. To date there is no indication that wheatears regularly migrate south in the Western Hemi-

sphere. The ones we see are apparently wandering birds lost from regular lines of travel.

VOICE: The northern wheatear's call is a harsh double *t'chach*, *t'chach* or a *weet*, *chack*, *chack*. The song consists of a short melodious warble interspersed with harsh rattles and squeaks and imitations of other birds.

NEST: Well hidden in rabbit burrows, under rocks, in rock piles, or crevices in cliffs, walls, and buildings. The flat, loosely woven nest is made of grasses and lined with fur or feathers. The 5 to 7 pale blue-green eggs (.86 x .63) are unmarked.

RANGE: (M.) Breeds throughout Europe, Asia, and n. Africa and in North America from Greenland west to the Boothia Peninsula and south to n. Quebec; from Bering Strait east to e.c. Alaska and south to the Yukon River. Winters in tropical Africa and s. Asia, accidental in the United States.

Townsend's Solitaire*

Myadestes townsendi—#19

IDENTIFICATION: L. $8\frac{3}{4}$. This is a long-tailed, short-billed, slim, dark bird with under parts slightly paler than upper parts. The light eye ring, white outer tail feathers, and buffy wing patches that show in flight identify it even in the juvenile plumage, which is spotted above and below.

HABITS: The solitaire is a bird of rough, mountainous country, where it lives in sparse growths of dwarf firs and willows above timber line on down to foothill canyons with scattered cedars. The birds reach greatest abundance in mature stands of conifers, open enough to favor their methods of obtaining food. Fly-catching from a treetop perch is common, but usually they spot their prey on the ground from a low perch, to which they return with the catch. In winter there is a partial movement to lower altitudes where cedar, mistletoe, and other berry-bearing plants are plentiful.

VOICE: The common call is a monotonously repeated short ventriloquial creaking, like a squeaky gate or wheel,

which at night becomes a muffled lower-pitched chant. The song, delivered from a treetop perch or while the bird is hovering in the air, is one of the finest of bird songs, with clear, brilliant, ringing notes that rise and fall in pitch and volume as the bird warbles and trills. Birds may be heard in song almost any season of the year.

NEST: Generally secreted in a cavity under a bank or at the base of a tree or in the roots of a fallen tree; made of any convenient fibrous debris, loosely formed into a cup, with a telltale overflow outside the cavity. The 4 dull white eggs (.87 x .66) are marked with many shades of brown.

RANGE: (P.M.) Breeds from s.c. Alberta, s.w. Mackenzie, and c.e. Alaska south to n.c. Mexico and east to w. Nebraska and w. Texas. Winters from s. British Columbia and Montana south and east to e. Nebraska and e.c. Texas.

OLD WORLD WARBLERS

Family SYLVIIDAE

Blue-gray Gnatcatcher

Polioptila caerulea—#15

IDENTIFICATION: L. 4½. The black-and-white tail which it waves about and frequently cocks at an angle and the white eye ring are this gnatcatcher's best field marks. Females are duller and lack the black edging to the headcap. Juveniles are a browner but paler gray. The call carries fairly well, and most individuals are located by sound.

HABITS: This is a bird of open woodlands and brushy growth interspersed with trees and isolated streamside groves. It seems to have an affinity for parklike stands of mature oaks and pines and is often found in shade trees. It is restless and active, often feeding in upper branches, where it flycatches and hovers to pluck insects off flowers or buds. Insects appear to be its sole food. In migration and in winter the birds move in small bands and may be found almost anywhere but most commonly high in forest trees.

VOICE: The distinctive call is a thin, high-pitched twanging or humming note like a plucked banjo string. The song is a soft, melodious warble, quite thin and chattery, with a wheezy or lisping quality. The bird is a great scolder, using a rapid series of buzzy squeaks.

NEST: The hummingbird-like cup of fine plant fibers and downs bound with spider webbing and decorated with lichens is saddled on a horizontal tree limb or placed in a crotch, where it looks like a knot. The height is variable, but generally it is well up in a tree. The 5 very pale blue-green eggs (.59 x .45) are speckled with brown.

RANGE: (P.M.) Breeds from s. New Jersey, w. Pennsylvania, s. Ontario, s. Wisconsin, Nebraska, Colorado, s. Nevada, and n.e. California south to Great Inagua in the Bahamas, the Gulf Coast, and s. Mexico. Winters from South Carolina, the Gulf Coast, s. Texas, and s. California south through Cuba to Guatemala.

Golden-crowned Kinglet

Regulus satrapa—*14

IDENTIFICATION: L. 4. Kinglets are short-tailed, olive-gray birds smaller than warblers. They have the unwarbler-like habit of nervously flicking open their wings as they jump from twig to twig. They do much of their feeding at branch tips and often flutter in the air as they pick out insects. The golden-crowned has no eye ring and, except in juvenile plumage, has a conspicuous white-and-black-bordered crown patch—orange in the male, yellow in the female. The 3-note lisping call is distinctive.

HABITS: In summer this is a bird of coniferous woodlands. Spruces are necessary for nesting, but populations often seem highest in open second-growth stands mixed with birch and fir. Here the birds nest and feed lower down and are more readily observed. During migration they frequent deciduous woods and thickets and tangles of weedy growth close to the ground. Occasionally they are

ensnared by the barbs of burdock burs. They seem wholly insectivorous, feeding on adults, larvae, pupae, and eggs. In winter, when they are quite gregarious, they commonly roam the woods with chickadees, brown creepers, and a downy woodpecker or two, showing a marked preference for conifers.

VOICE: The call, which is heard throughout the year, consists of 1 or a series of 3 rapid, identical, high-pitched, hissing notes much like a brown creeper's single, longer call note. The song, seldom heard except on breeding grounds, opens with a series of evenly pitched or rising notes similar to the call notes, followed by a series of louder, harsh, staccato chattering notes that fall in pitch.

NEST: Occasionally low but generally 30 to 60 feet up in a sheltered spot among the thick twigs of a conifer. The nest is almost globular, with a small entrance on top. Both top and bottom are woven into the surrounding twigs. The material is chiefly moss and usnea lichen bound with spider webbing, bark shreds, and rootlets and lined with feathers and fur. The 8 or 9 creamy eggs (.56 x .44) are speckled with brown spots of varying size.

RANGE: (P.M.) Breeds from Cape Breton Island, s. Quebec, c. Manitoba, c. Alberta, and s.c. Alaska south to Massachusetts, North Carolina (mts.), n. Michigan, New Mexico, and s. California. Winters from Nova Scotia, New York, s. Michigan, Iowa, and British Columbia south to n. Florida, the Gulf States, and through Mexico to Guatemala.

Ruby-crowned Kinglet

Regulus calendula—#14

IDENTIFICATION: L. $4\frac{1}{4}$. The only distinctive character of this active, plump little olive-colored bird is the white eye ring which gives its black eyes a fixed, staring look. Only the male has the ruby crown and it is seldom visible in the field. Unlike the golden-crowned, the ruby-crowned sings during spring and fall migrations.

HABITS: The summer home is in the predominantly evergreen northern forests or on their edges. This bird seems to like more open stands than the golden-crowned and often finds suitable conditions in spruce bogs and mixed woods. At other seasons it frequents any type of woody growth, although it still finds conifers attractive. Ruby-crowns are often common in streamside thickets, where they feed close to the ground. Seldom do they display marked gregariousness. Small quantities of seeds and berries are eaten in winter as a supplement to their insect diet.

VOICE: The call notes are wren-like. One is a single harsh, grating *kerr*, another a sharp, scolding chatter. The song is a beautiful one and the closing phrases amazingly loud for so small a bird. It starts with several thin, high-pitched introductory *zee, zee, zee's*, drops to several low-pitched *kew, kew, kew's*, and launches out into a series of loud, tinkling, melodious phrases in ascending groups of 3 short notes.

NEST: In spruce trees at any height but generally well up; a globular hanging structure woven into the pendant twigs of a branch at the densest part near the tip. Both nest and eggs are virtually indistinguishable from the golden-crowned's.

RANGE: (P.M.) Breeds from w.c. Quebec, n. Manitoba, n.w. Mackenzie, and n.w. Alaska south to Nova Scotia, n. Ontario, c. New Mexico, and s. California. Winters from Virginia, Iowa, and s. British Columbia south to s. Florida, the Gulf Coast, and through Mexico to Guatemala.

PIPITS

Family MOTACILLIDAE

Water Pipit*

Anthus spinoletta—#17

IDENTIFICATION: L. $6\frac{1}{2}$. Pipits are invariably seen on the ground in open places. Their long bills, slender bodies,

long dusky tails, and walking habits are distinctive. The birds nod as they walk and when resting frequently move their tails up and down. They are darker-backed and longer-legged than their common associate, the horned lark, which has a black tail more narrowly bordered with white. Spring birds are lighter and grayer above than the fall bird shown on the plate and are a more uniform and richer pink-buff below with narrower and less extensive streakings.

HABITS: In summer these pipits breed in the treeless tundra country of mountaintop and arctic. They migrate and winter in flocks that are sometimes enormous. They frequent open land and low wet places with standing water, old pastures or other areas of low vegetation, sand dunes and beaches, mud flats and burned or fallow fields. When flushed the flock jumps into the air simultaneously, uttering their distinctive call. Their flight is swift and buoyant, but erratic, and the flock strings out in a long, loose mass of undulating birds. Food consists of insects, mollusks, crustacea, seeds, and berries.

VOICE: Flight calls are of from one to many short, sharp, thin, high-pitched notes, generally paired. They are not unlike the horned lark's, but somewhat lower-pitched, more rolling, prolonged, and sibilant. The song, given from a perch on the ground, in a tree, or while soaring, is a weak, tinkling combination of single and double sibilant notes and trills.

NEST: On the ground in the shelter of a rock or bank or on the side of a moss-covered hummock; made of grass and twigs. The 4 or 5 pale gray eggs (.78 x .58) are thickly spotted with various shades of brown and marked with black lines.

RANGE: (M.) Breeds throughout the Northern Hemisphere; in North America from Greenland, n. Mackenzie, and n. Alaska south to Newfoundland, n. Manitoba, and New Mexico (mts.). Winters from s. New Jersey, s. Ohio,

Arkansas, New Mexico, and n. California south to n. Florida, the Gulf Coast, and through Mexico to Guatemala.

Sprague's Pipit*

Anthus spragueii—#17

IDENTIFICATION: L. $6\frac{1}{4}$. The generally paler appearance and the distinctly streaked head, neck, and back separate this bird from a water pipit in any plumage. The birds are very different in spring, Sprague's being almost white below, faintly tinged with buff, and finely and sparsely streaked.

HABITS: Although Europe has 8 other pipits besides the circumpolar water pipit we have only one—Sprague's, a bird of the western grasslands. When grasslands are plowed or burned it becomes scarce. Unless one detects their song, the birds are likely to be overlooked, as they stay hidden in grass when on the ground. If flushed they go off with a bounding, erratic flight. Nests have been located by the female's habit of rising off the nest to greet the male as it plunges earthward after a song flight. Insects and seeds are their chief foods, and in migration and winter the birds seem partial to weedy fields.

VOICE: The call as the bird takes wing consists of a series of single notes harsher than, and different from, the paired notes of the water pipit. The song, almost always delivered from several hundred feet in air, is occasionally given in fall and winter. The bird floats in circles for sometimes as much as an hour, singing at frequent intervals. Each song is a descending series of 7 or 8 double notes, high-pitched and clear, with a tinkling, metallic quality, the regular repetition of an accented note suggesting the veery's song.

NEST: In a hollow in the ground or in a tuft of coarse grass; a woven cup of grass, more or less concealed by a loose arch of grasses. The 4 or 5 pale gray eggs (.82 x .60) are uniformly blotched with purplish-brown.

RANGE: (M.) Breeds from s. Manitoba and c. Alberta south to n.w. Minnesota and Montana. Winters from s. Mississippi (occasionally South Carolina) and Texas south to s. Mexico.

WAXWINGSFamily BOMBYCILLIDAE**Bohemian Waxwing****Bombycilla garrula*—#11

IDENTIFICATION: L. 8. This species is characterized by rich brown under-tail coverts, grayer over-all appearance, and the white patch and yellow edging on the wings.

HABITS: There are many mysteries connected with this bird of the boreal forests. Its appearance in civilized areas is sporadic and unpredictable. Few breeding areas are known, but the flocks which invade the United States in winter are frequently enormous. When nesting the birds often form loose colonies in favorable areas, to which they may or may not return in subsequent years. They depend upon fruits and berries for the bulk of their food much of the year, and the varying success of regional berry crops is probably responsible for their erratic behavior. Some insects are eaten, and the birds do some fly-catching. In winter they are attracted by mountain ash and hawthorn, crab apples, rose hips, cedar and juniper berries. Like other fruit eaters, they can be brought to feeding shelves by raisins and cut pieces of other dried fruits.

VOICE: Its only call is a rough buzz or chatter. A flock appears to keep up a constant twittering.

NEST: From 4 to 50 feet up in a pine or isolated spruce or tamarack in open muskeg; a flat structure of twigs, usnea lichen, and grasses placed on a horizontal branch near the trunk. The 4 to 6 pale blue eggs (1.00 x .70) are profusely dotted with black and marked with irregular lines.

RANGE: (E.W.) Throughout the coniferous forests of the Northern Hemisphere. Breeds in North America from n.e.

Manitoba, n. Mackenzie, and w. Alaska south to n. Idaho. Wanders in winter south and east to Nova Scotia, Pennsylvania, Illinois, n. New Mexico, and s. California.

Cedar Waxwing*

Bombycilla cedrorum—#11

IDENTIFICATION: L. $7\frac{1}{4}$. The soft-colored, crested waxwings with their red-and-yellow trimmings and every feather in place are unique. Juveniles lack distinctive colors and are heavily streaked below. The species is characterized by its over-all brownish color, yellowish flanks, and white under-tail coverts.

HABITS: Throughout most of the year cedar waxwings roam the countryside in flocks from a dozen to well over a hundred. They stay close together in flight and alight in a bunch in the top of a tree, frequently sitting awhile before feeding. Their nesting season is late and variable, running from late June into August. Fruits, fresh and dried, are their chief food the year round. Insects are eaten in summer, when some are caught flycatcher-fashion from a tree-top perch.

VOICE: The only sounds are high-pitched whistled hisses or wheezy lips and a somewhat louder, more rattling or broken hiss. These are heard at all seasons and are given continuously in flight and when feeding.

NEST: From 6 to 35 feet up in the horizontal branches of a deciduous or coniferous tree or shrub. Preference is for orchards, shade trees, swamps, and open stands of scattered trees; dense forests are avoided. The large nest is loosely constructed of almost any available fibrous material. The 4 to 6 gray-blue eggs (.86 x .61) are well spotted with black and brown.

RANGE: (P.M.) Breeds from Cape Breton Island, s. Quebec, n. Ontario, c. Manitoba, and c. British Columbia south to n. Georgia, n. Arkansas, n. New Mexico, and n.w.

California. Winters from about Massachusetts, s. Ontario, s. Minnesota, and Oregon (irregularly farther north) south to the West Indies and Panama.

SHRIKES

Family LANIIDAE

Northern Shrike*

Lanius excubitor—#11

IDENTIFICATION: L. 10¼. The distinguishing characteristics of this species are its finely barred or scaly under parts, its absence of black feathers at the base of the upper half of the bill, and the pale basal portion of its lower mandible. Females are duller and slightly olive. Young are similarly marked in various shades of brown.

HABITS: In the North this bird frequents open growths and brush-bordered swamps and bogs. In winter its habitat preferences and feeding methods are like the loggerhead's. At this season it is largely dependent upon mice and birds for food. Every fourth year numbers of northern shrikes occur well south of their breeding grounds. As wild mice have a population cycle of about this period, it seems likely that they are the most important winter food, the shrikes finding it necessary to come south when the mouse cycle on their normal wintering grounds is at its low point.

Because they take higher animals, many people are prejudiced against shrikes as "butcher-birds." Actually, like every other wild animal, shrikes simply harvest a crop produced for, as it were, the purpose of enabling them to live. Apparently every animal has a reproductive rate high enough to produce a surplus for such uses.

VOICE: The rarely heard call is a harsh whistle or scream. Frequently the birds start singing on their wintering territory. The song suggests that of the catbird-thrasher family. It is delivered from a treetop perch and continues indefinitely. Harsh notes, squeaks, and mews are inter-

persed with fairly melodious trills, liquid warbles, and whistled notes repeated several times, many of the latter notes suggesting the songs and calls of other birds.

NEST: Well hidden in the branches of a tree, generally a dense conifer, at moderate heights from the ground. The large nest is a matted affair of twigs, mosses, lichens, feathers, and fur. The 4 to 6 grayish eggs (1.08 x .80) are spotted with browns and grays.

RANGE: (E.W.) Throughout the Northern Hemisphere. In North America breeds from n. Ungava, n. Mackenzie, and n.w. Alaska south to New Brunswick, s. Quebec, s.c. Ontario, c. Saskatchewan, and n. British Columbia. Wanders in winter south to Virginia, Kentucky, Missouri, Texas, New Mexico, and n. California.

Loggerhead Shrike*

Lanius ludovicianus—#11

IDENTIFICATION: L. 9. Shrikes are plump, big-headed, slim-tailed birds. They generally fly close to the ground, a rapid series of wingbeats followed by a short sail being the usual pattern. In flight the white area in the center of the black wings flashes at each wingbeat. At the end of a flight the birds glide up suddenly to a conspicuous perch. After lighting they frequently tilt their tails. Adults are clear white below and black-billed and have black feathers across the forehead at the base of the bill. Juveniles are brownish above and barred below, but immatures are about like adults.

HABITS: This is a bird of open country with woody growths for nest sites and lookout perches. Rural areas with fields, hedgerows, scattered trees, fence and public-utility poles, and wires afford the ideal habitat. Although they can hover in one spot as they scan the ground, most loggerheads spend their time on conspicuous perches, searching the ground with remarkably keen eyes. Their chief foods are large insects like grasshoppers and crickets, but snakes, lizards,

frogs, mice, and birds are taken. To tear up large prey into pieces for swallowing, the shrike usually wedges it into a crotch or impales it on a thorn or fence wire barb.

VOICE: Calls and notes are similar to the northern's. No one seems to be familiar enough with both species to describe the differences.

NEST: From 2 to 20 feet up in a tree or thorny shrub, generally well into the center of the plant; a deep cup of twigs, stems, and grasses heavily lined with matted plant downs, wools, and feathers. The 4 to 6 white eggs (.96 x .72) are thickly marked with browns and grays.

RANGE: (P.M.) Breeds from New Brunswick, s. Quebec, s. Ontario, s. Manitoba, n. Saskatchewan, and c. British Columbia south to s. Florida, the Gulf Coast, and s. Mexico. Winters from Virginia, s. Missouri, New Mexico, and n. California (rarely farther north) south through Mexico.

STARLINGS

Family STURNIDAE

Starling*

Sturnus vulgaris—#33

IDENTIFICATION: L. $8\frac{1}{2}$. The starling is a chunky, short-tailed "blackbird" with a long pointed bill and pointed wings. In spring the bills are yellow, at other seasons dusky-brown. The white and buffy tips to the body feathers, conspicuous in fresh fall plumage, wear off by spring. Juveniles are gray-brown, streaked with white on chin and throat. In flight the starling's stubby appearance and short triangular wings, paler beneath, are distinctive.

HABITS: This immigrant from Europe has thrived in North America and is still increasing its range. Most rural areas with plowed croplands, hayfields, and pastures provide ideal habitat. During summer nest sites must be available near such lands, and later places to roost at night must be within reasonable flying distance. For the latter tree groves

are acceptable until the trees shed their leaves, after which starlings seek beds of cattails or other rank marsh vegetation. When coldest weather comes the preferred roost for those that have not gone south seems to be on or about buildings in towns and cities.

Starlings are quite gregarious, except when nesting, and often associate in flocks with red-winged and rusty blackbirds, cowbirds, and grackles, but they do not share their town roosts with these species. The maneuvering of a flock of starlings is remarkable. How an apparently leaderless mass of individuals can achieve such perfect timing and co-ordination is an unsolved mystery. Starlings do most of their feeding on the ground, where their short legs give them a distinctive waddling gait as they search for weevils, beetles, and grasshoppers. These and other insects supply over half the starling's food, the balance consisting of fruits, mostly wild, although they take cherries and mulberries and some seeds.

VOICE: The common call is a drawn-out rising whistle. Starlings are noisy at all seasons, and the song is a jumble of squeaks, rattles, wheezes, loud whistles, and imitations (often excellent) of other birds.

NEST: Generally from 10 to 25 feet up in a natural or woodpecker hole in a tree, or in any other cavity about buildings, cliffs, or rocks. Sometimes a number of pairs nest close together. The nest cavity is loosely filled with sticks, stems, grasses, and like material with a lining of finer grass and feathers. The 4 or 5 pale blue eggs (1.19 x .83) are unmarked; 2 broods and occasionally 3 are raised.

RANGE: (P.M.) Native to Europe, Asia, and n. Africa. Introduced into North America in 1890 in New York City. Has now spread as far as s. Quebec, n. Manitoba, c. Alberta, California, n. Florida, the Gulf Coast, and n. Mexico.

VIREOS

Family VIREONIDAE

Black-capped Vireo**Vireo atricapillus*—#20

IDENTIFICATION: L. $4\frac{1}{2}$. The black-and-white head markings are distinctive, though in females they may be more slaty-black. Young have the same pattern in dull brown and buff.

HABITS: Low brushy growths in rough dry country seem to be the preferred habitat. The birds occur in dense scrub oak of hilltops and ridges as well as in the more scattered thickets in the numerous ravines of the semi-arid country, to which the species is confined. The black-capped is unusually quick and active for a vireo. It stays so close to cover that it is generally hard to see. Usually the best clue to its presence is its song, which rings out in the narrow canyons.

VOICE: The song consists of deliberate 2- and 3-note phrases, recalling at times a white-eyed vireo's. The quality varies from harsh and vehement to sweet and bell-like, giving the effect of a gentle warble. The delivery is rather deliberate, and often 2 slightly different phrases are alternated. The bird is a persistent singer from early spring to late summer.

NEST: Usually about 4 feet up in the center of a thick shrub clump. The nest is thick-walled for a vireo's and is often decorated on the outside with bits of lichen. The 4 white eggs (.71 x .53) are unmarked.

RANGE: (M.) Breeds from s.w. Kansas south to c. and w. Texas. Winters in Mexico.

White-eyed Vireo**Vireo griseus*—#20

IDENTIFICATION: L. 5. If the white iris is not visible, the combination of wing bars and eye ring, uniformly colored upper parts, and white under parts washed with yellow

are distinctive. This species is more commonly heard than seen, and the song is distinctive.

HABITS: Dense thickets, often briary and overgrown with vines, in low moist areas are the favorite habitat of this bird, which seldom ranges far from the ground. Heavy stands of young second growth on uplands and hillsides are also occupied. While largely insectivorous, this vireo in winter eats such fruits as sumiac, grapes, and wax myrtle. Active and inquisitive, it comes readily to a series of squeaks.

VOICE: The white-eye has several calls—a harsh mewing note, a short tick, and a single loud whistle. The song is an emphatic series of 5 to 7 sharply separated notes. These vary greatly, and each individual has several songs. The bird, a persistent singer, repeats a given song over and over. Most variations suggest a series of words or syllables like *chip-wheel-oo*, or *chick-per-weo-chick*.

NEST: About 3 to 6 feet aboveground, well hidden in thick, low growths. The nest is fairly bulky for a vireo and more cone- than cup-shaped. It is often ragged-looking because of the leaves, moss, wasp paper, and sticks woven in with its soft woody fibers. The 4 white eggs (.74 x .55) have a few scattered small brown dots.

RANGE: (P.M.) Breeds from Massachusetts, Ohio, s. Wisconsin, and s.e. Nebraska south to s. Florida, the Gulf Coast, and c. Mexico. Winters from South Carolina, s. Alabama, and s. Texas south to Honduras.

Bell's Vireo*

Vireo bellii—#21

IDENTIFICATION: L. $4\frac{3}{4}$. The rather stout, slightly hooked, typical vireo bill separates this plainly colored species from a kinglet. It has two wing bars like the white-eye but only a narrow, interrupted eye ring and a dark eye. It is slenderer than the white-eye, grayer above and paler yellow below, only its rump being bright olive-green.

HABITS: Bottom-land thickets of willow and cottonwood seem to be the preferred habitat, but almost any low woody growths may be utilized for nesting or feeding. The birds are seldom seen more than 6 feet aboveground. They depend upon insects for food and take more grasshoppers than any other vireo.

VOICE: This bird has a distinctive scolding call of 3 rapid notes. The song, an unmusical warble, suggests a white-eye's but is a more rapid jumble of chattering notes, alternately ending first with an upward, then with a downward inflection. Occasionally the song is a series of scolds, squeaks, and sputters. The bird sings into September and is a persistent day-long performer. Its most surprising habit is singing on the nest.

NEST: Height from 1 to 10 feet, commonly about 3 feet up in a dense tree or shrub. The nest is often fairly deep and purse-shaped. The outside is frequently decorated with blossoms and multicolored cocoon silks. The 4 white eggs (.68 x .49) have a few fine brown dots.

RANGE: (P.M.) Breeds from n.w. Indiana, s. South Dakota, n.e. Colorado, s.w. New Mexico, s. Arizona, and n. California south to c. Texas and Guatemala.

Yellow-throated Vireo*

Vireo flavifrons—#20

IDENTIFICATION: L. 6. The clear bright yellow throat, breast, and "spectacles," the well-defined white wing bars and gray rump are distinctive. A pine warbler is slenderer, with a finer bill, dusky streaks on the under parts, and all greenish upper parts.

HABITS: Open stands of tall, mature deciduous trees along streams, roadsides, and in residential areas seem to be preferred. The species also frequents orchards and woodland borders but avoids conifers and dense second growth. Feeding is in the leafy crowns of trees, with insects almost its only food. When feeding the bird is slow and deliberate,

very unlike the active warblers. It is so hard to see that identification is usually based upon the song. Fortunately it is a persistent singer.

VOICE: The scolding call is very harsh. The song is like a red-eye's but more deliberate, huskier, and lower-pitched. It is composed of rich, reedy notes slurred together and is pleasanter than a red-eye's, although the phrases are shorter and less varied. A 2-note falling slur is quite distinctive and occurs frequently.

NEST: In a forked twig, generally off a main branch not far from the trunk of a tree. The height varies from 12 to 30 feet. Much spider-web silk is used in the deep, sturdily built cup, which is beautifully decorated with lichens, moss, and spider egg cases. The 4 white to pink eggs (.82 x .59) are heavily spotted and blotched with browns.

RANGE: (M.) Breeds from Maine, s.w. Quebec, s.e. Ontario, s. Manitoba, and e.c. Saskatchewan south to n. Florida, c. Alabama, c. Louisiana, and c. Texas. Winters from s. Mexico south to Venezuela.

Blue-headed Vireo*

Vireo solitarius—#20

IDENTIFICATION: L. 6. The white "spectacles," conspicuous against the dark slate-gray head, are the best field mark. The pure-white throat contrasts strongly with the dark face.

HABITS: The blue-headed is a bird of coniferous or mixed conifer-deciduous woodlands. It prefers the vicinity of openings in the forest canopy, where, in response to greater illumination, young trees and other low vegetation are thicker. This species is remarkably fearless. The birds feed in low growths and treetops and eat little except insects.

VOICE: One call is a trumpetlike series of nasal notes; another is 2 pleasingly soft notes, the second a descending trill. The song is usually a typical vireo series of short phrases

broken by pauses, higher-pitched, clearer, and sweeter than the red-eye's. Each bird has a number of different 2- to 4-note phrases which it sings at random. Abrupt changes of pitch are common, as are slurs, both often occurring in a single short phrase. Occasionally pauses are omitted and a beautiful rich warble pours forth.

NEST: The usual basketlike vireo nest. Ordinarily it is 5 to 10 feet high on a forked twig well toward the center of a small tree. The 4 white eggs (.77 x .57) are sparingly spotted with browns.

RANGE: (P.M.) Breeds from Cape Breton Island, s. Quebec, n. Ontario, c. Manitoba, s. Mackenzie, and c. British Columbia south to Connecticut, n. Georgia (mts.), Michigan, c. Minnesota, and c. Mexico (mts.). Winters from South Carolina and the Gulf Coast south to n. Nicaragua.

Black-whiskered Vireo*

Vireo altiloquus—#20

IDENTIFICATION: L. 6½. The fine dusky streaks on either side of the throat are distinctive. The slightly larger bill is not much help in the field. The immature bird is browner above, with a pale yellowish wing bar and a somewhat buffy chin and throat.

HABITS: In Florida this vireo is found chiefly in the mangrove forests that fringe the coast and in the dense vegetation of the keys. Elsewhere it ranges widely through scrub growth and the shade trees of plantations and towns. The birds feed from treetops down almost to the ground. Berries and seeds appear to be as common in their diet as insects.

VOICE: The song is composed of rather short, abrupt 1- to 4-note phrases broken by pauses. One note is often strongly accented, the others weak. Its local names, whip-Tom-Kelly, John-to-whit, or cheap-John-stir-up, suggest the cadence.

NEST: A cup suspended from a forked horizontal twig from 6 to 15 feet aboveground. The fibrous material used in its

construction varies with the locality. The usual site in Florida is in red mangrove over water. The 3 pale pinkish eggs (.89 x .61) have a few fine dots.

RANGE: (P.M.) Breeds from the Bahamas and c.w. Florida south through the Greater and Lesser Antilles. Winters from Hispaniola east and south to n. South America.

Yellow-green Vireo*

Vireo flavoviridis—#20

IDENTIFICATION: L. $6\frac{1}{2}$. This bird is much greener above than a red-eye, and the markings on the sides of the head are less distinct. The clear yellow under-tail coverts and bright greenish sides are also diagnostic.

HABITS: This bird is abundant throughout Middle America, and many regard it as a race of the red-eyed vireo. It prefers light open woodland and second growth with plenty of low shrubbery. About settlements it likes shade trees. Low ground near streams or swamps also attracts it. Insects as well as small berries and fruits are taken as food.

VOICE: The scold note is like a red-eyed vireo's. The song is similar except that the phrases seem shorter, the intervals longer.

NEST: From 4 to 10 feet up in the fork of a small branch where it is well sheltered by leaves; a deep cup of weed fibers, bark, and leaves bound together with cobwebs and often decorated with white and yellow spider egg cases. The 3 white eggs (.81 x .57) are sparingly spotted with brown.

RANGE: (M.) Breeds from extreme s. Texas and Sinaloa south to the Canal Zone. Winters in e. Peru and e. Ecuador.

Red-eyed Vireo*

Vireo olivaceus—#20

IDENTIFICATION: L. $6\frac{1}{4}$. A clear white line over the eye bordered with black on a gray-headed greenish bird without wing bars is distinctive. The red eye is of little value as a

field mark. Under parts are a cleaner white than those of any other vireo, only the sides and flanks being lightly washed with dirty greenish-yellow.

HABITS: The red-eye occurs wherever trees grow, even in isolated prairie groves. It nests low but belongs essentially to the forest canopy far overhead. The summer food is insects, but in fall these birds relish blueberries, the berries of dogwood, spicebush, sassafras, and magnolia, as well as a great variety of small fruits. Undoubtedly the red-eye was once the most abundant bird in North America, and it may still enjoy this distinction, despite the fact that vast areas that were once good red-eye habitat have been cleared and are now occupied by birds requiring more open types of country. Today on the average there is probably a pair of red-eyes for every acre of woodland within their range.

VOICE: The call is a harsh mewling note. The song is a monotonous and almost endless series of slightly varied phrases with sharp pauses between. Each phrase is of from 2 to 6 notes rapidly run together and ending with an upward or downward inflection. The whole effect suggests a long monologue, and the bird is often called "preacher." It sings all day long as it feeds.

NEST: The red-eye prefers to nest within 5 feet of the ground but will go up to 25 feet. All vireo nests are much alike—a well-made thin-walled ridged cup suspended by the rim in the fork of a horizontal twig. Soft, flexible woody fibers from weathered bark and weed stems firmly bound together with spider and caterpillar silk hold in place wasp paper, plant downs, and leaves. The center usually has a lining of fine grasses, rootlets, or hair. The outside is camouflaged with spider cocoons, lichens, or bits of blossoms, leaves, or moss. The nests withstand the weather for several years and are often taken over by the arboreal white-footed mouse. The 3 or 4 white eggs (.85 x .55) are sparsely spotted with dark brown.

RANGE: (M.) Breeds from Anticosti Island, c. Ontario, c. Manitoba, c.w. Mackenzie, and c. British Columbia south to c. Florida, s. Alabama, n. Coahuila, e. Colorado, s. Montana, and n. Oregon. Winters from Venezuela and Colombia south to s. Brazil and Ecuador.

Philadelphia Vireo*

Vireo philadelphicus—#20

IDENTIFICATION: L. $4\frac{3}{4}$. This is the only vireo with a line over the eye, plain wings, and extensively yellow under parts. Although not as bright a yellow as the throat and breast of a yellow-throated vireo, virtually the entire under parts of this species are a pale yellow. The area between eye and bill is dark, while in the similar warbling vireo it is light.

HABITS: On its breeding grounds this vireo favors woodland edges, young deciduous second growth in old clearings and burned-over areas, and willow and alder thickets along streams or about ponds and lakes. The birds feed both in treetops and in the dense shrubbery of moist areas. When feeding they are quite active for a vireo, often hanging upside down or fluttering before a tuft of leaves to pick out insects. From time to time they dart into the air to snap up flying insects. In fall their diet is supplemented with wild fruits.

One of the best tests of a field ornithologist's ability is the number of Philadelphia vireos he identifies in migration. It is not an uncommon bird, but through most areas it moves rapidly with the last wave of warblers in spring and goes south with the main warbler movement in fall. One should keep careful watch on road- and streamside thickets and investigate any red-eye song that doesn't sound quite right.

VOICE: The song is like a red-eye's with recognizable differences. The Philadelphia's is higher-pitched, some of its phrases weaker, and the whole much more slowly and dis-

connectedly uttered. Frequently a rising liquid phrase of 2 notes connected by a slight trill occurs.

NEST: Apparently this species chooses a deciduous tree even in woodlands that are predominantly coniferous. Sites vary from 10 to 40 feet high and are either in the crown of a small tree or on the horizontal branches of a tall one. Paper-birch bark, willow downs, and shreds of usnea lichen are usually conspicuous in the cuplike nest. The 4 white eggs (.74 x .55) are sparsely spotted with browns.

RANGE: (M.) Breeds from New Brunswick, n. Ontario, and n. Alberta south to n. New Hampshire, n. Michigan, and n. North Dakota. Winters in Central America.

Warbling Vireo*

Vireo gilvus—#20

IDENTIFICATION: L. $5\frac{3}{4}$. This is the grayest and palest of our vireos and has the weakest head markings. Occasionally the sides and flanks have a yellow tinge, but the area between the eye and bill is white. The song is unmistakable.

HABITS: Open woodlands, river-bottom stands of mature cottonwoods and willows, borders of woodland clearing, and isolated prairie groves are typical haunts. The bird is often common in elms and other shade trees, as well as in orchards and rows of trees between fields and along roads in farming country. It feeds high up in the leafy crowns of trees and, except for its song, would be hard to identify.

VOICE: The calls are catbird-like mewings. The song is a clear, pleasant warble of 12 to 20 notes run together, unhurried, not overly loud, and with considerable variation in pitch. The song is reminiscent of the purple finch, and it has been estimated that the warbling vireo utters it some 4,000 times a day during the breeding season.

NEST: Usually high up and out near the end of a slender, drooping branch of a large, well-developed tree growing in the open, occasionally within a few feet of the ground; a

typical vireo cup suspended from a fork in a twig. The 4 white eggs (.72 x .52) are sparingly spotted with brown.

RANGE: (M.) Breeds from Nova Scotia, c. Ontario, s. Manitoba, n.c. Alberta, s.w. Mackenzie, and s. British Columbia south to North Carolina, s. Louisiana, New Mexico, n. Sonora, and s. Lower California. Probably winters in c. and n. South America.

HONEY CREEPERS

Family COEREBIDAE

Bahama Bananaquit*

Coereba bahamensis—#21

IDENTIFICATION: L. 5. The curved bill, the white line over the eye, and the yellow rump and abdomen are distinctive. Young birds are similar but paler and duller.

HABITS: These birds are at home wherever there are flowering plants or ripening fruit. The many flowering trees and shrubs of the tropics attract them as strongly as they do hummingbirds. Lacking the ability to hover, they hang on as best they can while probing blossoms for the nectar and small insects inside. They also pierce ripening fruits to feed on the juices.

VOICE: The common call is a sharp chirp, and they also make a chattering sound. The song is a series of low crackling notes with a marked sibilance.

NEST: Out near the end of a limb a few to more than 30 feet aboveground; a globular mass of leaves and fibrous material with the entrance in the side. The 3 white eggs (.69 x .51) are spotted with brown. Throughout the year the birds use these nests for night roosts.

RANGE: (R.) Resident in the Bahamas and Cayman Islands. Occasionally seen in s. Florida.

WOOD WARBLERS

Family COMPSOTHTYPIIDAE

Black and White Warbler*

Mniotilta varia—#29

IDENTIFICATION: L. $5\frac{1}{4}$. The striped black and white all-over appearance and the creeper-like habits are distinctive. Females are similar to males but duller, with a trace of brown on the sides and indistinct streakings below. Juveniles have the distinctive head stripes, but the body stripes are two shades of brown. Immatures in fall retain much of the brown body plumage.

HABITS: This warbler is found in all types of wooded areas from mature forests to second growths. In deciduous and mixed woodlands it is generally common. It also occurs in northern conifer forests but is not as abundant there, nor as evenly distributed. Insects are its only known food, and its method of feeding like a creeper or a nuthatch on the main branches and trunks of trees enables it to find egg masses and pupae in cracks in the bark.

VOICE: This bird has 2 call notes, a weak *tsip* and a louder *chink*. When alarmed it gives a loud, hissing *chee-chee-chee*. The common song is a monotonous series of 6 to 12 double syllables, the second note of each lower than the first, which gives it a rolling sound. The quality is clear but buzzy and not very musical.

NEST: On the ground in a depression at the foot of or under a stump, log, or rock; made of dead leaves, bark fibers, grass, and rootlets and lined with hair or fern down. The 4 or 5 white eggs (.66 x .53) are thickly spotted with browns and purples.

RANGE: (M.) Breeds from Newfoundland, n. Ontario, c. Manitoba, and c.w. Mackenzie south to n. Georgia, c. Alabama, and e. Texas and west to South Dakota and Kansas. Winters from Florida and n. Mexico south to Guadeloupe, Venezuela, and Ecuador.

Prothonotary Warbler**Protonotaria citrea*—#21

IDENTIFICATION: L. $5\frac{1}{2}$. Females differ from males only in being duller and paler—the yellow of the head less intense. In fall males become dusky across the back of the head while immatures resemble females.

HABITS: Swamp woodlands, willow-grown banks, and frequently flooded wooded bottom lands are the home of these birds. Where nest sites near or over water are lacking they go several hundred feet inland but continue to feed near water in the low shrubs, fallen trees, and flood debris characteristic of the habitat.

VOICE: A soft *tchip* call note and a sharp alarm note like that of a Louisiana water-thrush. The song is a vigorous, ringing repetition (4 to 8 times) of a single *peet* or *tweet*, not unlike that of a solitary sandpiper. The flight song starts like the others but ends in a pleasing warble.

NEST: This is the only eastern warbler that nests in a tree cavity. A rotted-out hole in a dead willow stub 5 to 10 feet above water is typical. Old woodpecker holes are much used and properly placed birdhouses are readily accepted, as are all manner of odd crannies about man-made structures. The cavity is always stuffed, often chiefly with moss, to form a nest cup. The 6 creamy-white eggs (.70 x .57) are heavily marked with browns and purples.

RANGE: (M.) Breeds from c. Delaware, s. Ontario, s.e. Minnesota, and n.e. Nebraska south to n. Florida and e. Texas. Winters from Nicaragua to Colombia.

Swainson's Warbler**Limnothlypis swainsonii*—#30

IDENTIFICATION: L. 5. Adults are alike and unmistakable. Immatures are olive-brown above with reddish-brown wings, a strongly yellowish eye stripe, and yellowish under parts.

HABITS: This bird lives in two rather different habitats. In the low country along the coast it is restricted to the cane-breaks bordering the streams that intersect pine flat woods. It seems doubtful that it uses the adjacent tangled shrubby growth and deciduous trees. In mountainous country it is found in rhododendron tangles in valley bottoms, stream banks, and swamps.

VOICE: Call note is a clear-ringing *chirp*. The song is clear, pleasing, and often ventriloquial. It starts with 2 or 3 even or falling notes followed by an emphatic 4-syllabled phrase like the song of a white-eyed vireo. Often it suggests the songs of the hooded warbler and the Louisiana water-thrush.

NEST: From 2 to 10 feet up in dense cover which varies from canebrakes to shrub and vine tangles; a loose, bulky mass of dead leaves lined with fine fibrous material like rootlets, pine needles, and hair. The 3 bluish-white eggs (.77 x .59) are unmarked.

RANGE: (M.) Breeds from s.e. Virginia, s. Indiana, and n.e. Oklahoma south to n. Florida and Louisiana. Winters in Jamaica and s. Yucatan.

Worm-eating Warbler* *Helmintheros vermivorus*—#30

IDENTIFICATION: L. 5½. These birds can always be identified by the bold head striping and plain body plumage. Juveniles are brownish instead of olive, and their head stripes are brown. Immatures are like adults except for a touch of rusty-brown on the wing.

HABITS: Second-growth deciduous woodlands of comparatively young trees provided with a vigorous shrubby understory are preferred, but the birds are also fond of hill-sides above brush-grown swamps or watercourses. They do most of their feeding on or near the ground. They are not very active and move quietly. On the ground they walk with the tail high.

VOICE: A rapid trill like a chipping sparrow's, but louder and richer. A given song may fluctuate in volume as it progresses. The rarely heard flight song is twittery and goldfinch-like.

NEST: On the ground, most commonly on a hillside in a thick drift of old leaves. The nest is of dead or skeletonized leaves, lined with reddish moss stalks. The 4 or 5 white eggs (.69 x .53) are variably marked with browns.

RANGE: (M.) Breeds from s. New England, w. New York, n. Indiana, and s. Iowa south to Virginia, n. Georgia, and s. Missouri. Winters in the Bahamas, the w. West Indies, and Central America from Chiapas to Panama.

Golden-winged Warbler *Vermivora chrysoptera*—#24

IDENTIFICATION: L. 5. The male's black-and-yellow markings are distinctive. In fall olive-green feather tips obscure the yellow and give the back a greenish appearance. The female looks like a fall male, except for gray instead of black head markings. Juveniles are grayish olive-green above and pale olive-yellow below with greenish wing bars.

HABITS: This warbler is always associated with openings in deciduous woodlands well grown up with woody plants and rank weeds and grasses. These openings may be along the borders of streams and wet low spots or in abandoned pastures or overgrown lumbering sites. The birds feed chickadee-fashion, hanging upside down near the twig ends, picking insects from the undersides of leaves. Feeding is carried on from treetops to dense brush near the ground.

VOICE: A series of 4 or 5 dry, insectlike, buzzy notes, the first higher than the rest, which are all on the same pitch—like *see, buzz-buzz-buzz-buzz*.

NEST: On or near the ground, hidden in the stems of a rank weed like goldenrod. The bulky nest consists of a foundation of dead leaves and a cup of coarse fibers, e.g., grape-

vine bark. The 5 white eggs (.66 x .51) are well speckled and blotched with browns and purples.

RANGE: (M.) Breeds from Massachusetts, c. Michigan, and c. Minnesota south to n. New Jersey, n. Georgia (mts.), n. Indiana, and n. Iowa. Winters from Guatemala south to Colombia and Venezuela.

Blue-winged Warbler*

Vermivora pinus—#24

IDENTIFICATION: L. $4\frac{3}{4}$. The black line from bill to eye and beyond and the gray wings with two strong wing bars are distinctive. Females are duller and have less yellow on the crown and less white on the tail. Juveniles are olive-green, darkest on the back and throat, with wings like adults.

HABITS: The blue-winged, a bird of weed-grown brushlands, is most commonly found in abandoned fields or semi-wild pastures with scattered clumps of briars and young trees. Woodland openings and borders, stream and swamp margins are frequent haunts. Occasionally it is found in the heart of the forest if there is plenty of undergrowth. The male sings from a high treetop perch, but the birds do most of their feeding in small trees and shrubs. They are vireo-like in the deliberation of their feeding movements.

VOICE: The common song is a double buzz, the first note generally higher in pitch than the second—seeeee, buzzzzzz. Another is a series of short notes ending first with a rising buzz, then a falling one—tsee, tsee, tsee, tsee, tsee, tsee, buzzz-see-see-buzzz.

NEST: On or very near the ground in dense vegetation. The small deep cup is supported by surrounding stems and is made of dead leaves and coarse grass with small quantities of other fibers. The 5 white eggs (.64 x .51) are finely speckled with brown.

RANGE: (M.) Breeds from s. Massachusetts, w. New York, s. Michigan, and s.e. Minnesota south to Maryland, n.

Georgia (mts.), Kentucky, c. Missouri, and n.e. Kansas. Winters from s. Mexico south to Guatemala.

Golden-winged x Blue-winged Warbler Hybrids

Vermivora chrysoptera x *Vermivora pinus*—#24

IDENTIFICATION: These birds are somewhat variable in appearance. Brewster hybrids may have the gray back more or less washed with olive-green, and the white under parts may show yellow, especially on the breast. The wing bars may be broadly yellow or white. The duller females usually have more green on the back and more yellow on the under parts than the average male. Lawrence hybrids run closer to type, but the wing bars may be broad and either yellow or white, or narrowly white. Females are like female blue-wingeds with dusky olive instead of black cheek and throat markings and occasionally a broad yellow wing bar.

HABITS: So far as is known, the hybrids behave like the two parent species which, in turn, have similar habits.

VOICE: Some individuals have a song like the golden-winged's, others like the blue-winged's, or the song may be a mixture of the two, each bird having its own variation. Generally Brewster's sing more like golden-wingeds, Lawrence's like blue-wingeds.

RANGE: (M.) See range of the two preceding species. These hybrids are the result of interbreeding where the ranges of the parent species overlap. Their winter range is unknown.

COMMENT: Hybrids in nature are rare, and when they occur it is usually between closely related species. Among North American birds the most notable hybrids are produced when golden-winged and blue-winged warblers interbreed. The bird that results from the initial cross is different from either parent. Originally it was described as a distinct

GOLDEN-WINGED×BLUE-WINGED WARBLER HYBRIDS



Golden-winged Warbler



Blue-winged Warbler

White under parts genes W-W
Unplain throat (black) genes p-p

Unwhite under parts (yellow) genes w-w
Plain throat genes P-P

Parents (P₁)



Normal body cells



P₁ gametes



Sperm or Egg cells

First generation (F₁)

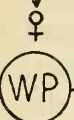


White under parts W-w
Plain throat P-p

F₁ gametes ♂



FIRST GENERATION OFFSPRING OF BREWSTER HYBRIDS



 WP WP Brewster Type	 Wp WP Brewster Type	 wP WP Brewster Type	 wp WP Brewster Hybrid
 WP Wp Brewster Type	 Wp Wp Golden-Wing Warbler	 wP Wp Brewster Hybrid	 wp Wp Golden-Wing Type
 WP wP Brewster Type	 Wp wp Brewster Hybrid	 wP wp Blue-Wing Warbler	 wp wp Blue-Wing Type
 WP wp Brewster Hybrid	 Wp wp Golden-Wing Type	 wP wp Blue-Wing Type	 wp wp Lawrence Hybrid



Unwhite under parts w-w
Unplain throat p-p

species and called Brewster's warbler. Occasionally, when one hybrid breeds with another, a new and distinctive plumage results. Birds of this type were originally described as Lawrence's warblers.

The basic genetics of these interesting crosses is set forth here in graphic form. Every normal living cell has within it pairs of bodies known as chromosomes, each of which contains a series of individual inheritance units known as genes. Each pair of genes controls the development of color, form, or other attribute of some part of the body of the individual. As one gene in each pair came from the male parent and the other from the female, the genes for a given character may or may not be alike in the two chromosomes of a given pair. When they are alike they jointly regulate the development of a given character; i.e., they pull together. But when a gene from one parent is entirely different from the corresponding gene from the other, one gene is commonly stronger and dominates. The stronger is called the "dominant" and the weaker the "recessive" gene.

The color gene of the blue-winged warbler which produces a plain throat is always dominant when paired with a golden-winged's black throat-color gene: therefore, the hybrid's throat is plain. Similarly the golden-winged's under-part-color gene which produces white under parts is dominant over the yellow under-part-color gene of the blue-winged. The result, then, of this initial cross is always a plain-throated bird with largely white under parts; i.e., Brewster's warbler. Occasionally in second or subsequent generations an individual hybrid inherits from both parents the weak or recessive genes for throat and under-part color, in which case it becomes a black-throated bird with yellow under parts; i.e., Lawrence's warbler.

For simplicity the result of a pure Brewster mating is shown. Whether such matings occur is unknown, but the chances are against it. Most Lawrence's hybrids probably result from matings of Brewster's with impure blue-winged

or golden-winged birds: in this way an occasional offspring could obtain both of the necessary pairs of recessive genes.

Bachman's Warbler

Vermivora bachmanii—#22

IDENTIFICATION: L. $4\frac{1}{4}$. The male could be confused only with the much larger hooded warbler in which the black on breast and crown are connected along the neck. The gray-headed female differs from the more extensively gray-headed Nashville warbler in having the forehead and eye ring yellowish. Immature males have a smaller, partly obscured throat patch, and immature females are less yellow and have grayer backs.

HABITS: These warblers have generally been found breeding in heavily wooded swamps and bottom lands, where they nest in tangled brush on the higher areas. In migration they seem to keep to the tops of the tallest trees along swamp-fringed rivers. At other times, especially when nesting, they feed in lower swamp levels. During the nesting period, which often starts in March, they are persistent singers. This bird has suffered from the cutting of swamp timber and from agricultural drainage. Many of its former haunts are gone, and the demand for further lumber and drainage bode ill for what is perhaps the rarest of North American warblers.

VOICE: The song is a rattly trill of some 8 notes on the same pitch. It resembles the song of a worm-eating warbler or chipping sparrow, but the pitch is higher and the quality nearer that of a lazy parula warbler. Another song much like a prothonotary's vigorous *tweet, tweet, tweet* has been noted.

NEST: One to 3 feet off the ground among upright stalks of cane, blackberry, or other low shrubs; a cup of stems and leaves lined with fine black fibers. The 3 or 4 eggs (.63 x .48) are pure white.

RANGE: (M.) Probably breeds, or once bred, from e. North Carolina, s. Indiana, and s.e. Missouri south to South Carolina, c. Alabama, and n.e. Arkansas. Winters in Cuba and the Isle of Pines.

Tennessee Warbler

Vermivora peregrina—#30

IDENTIFICATION: L. 5. Except for its smaller size and thin, fine-pointed bill, this bird looks a good deal like a vireo, but its quick, nervous activity is in strong contrast with the vireo's slow deliberation. Among warblers the light line over the eye is distinctive. Only the spring male has clear gray on the head, a clear white eyeline, and fairly white under parts. In all other plumages the birds are rather uniformly bright olive-green above; eyeline and under parts are rather yellow or greenish-yellow, except for the pure-white under-tail coverts.

HABITS: The summer home is about openings and clearings in northern woodlands. The birds seem to need grassy or boggy areas mixed with dense brush and clumps of young second-growth timber. In such areas they are often so abundant as to seem colonial in their nesting habits. Their normal food is small insects, but they do pierce ripe grapes to drink the juice. Some berry eating is reported, and at a feeding station they displayed a liking for bananas. In spring they feed in treetops, but in fall they are everywhere in weed tangles and hedgerows.

Audubon saw only three Tennessees, a fact hard to reconcile with their present abundance. The increase in population is probably due to the increase (because of forest destruction) in the brushy, semi-open country which the species requires for nesting.

VOICE: The songs are variable but are all of a sharp quality like the chatter of chimney swifts. A common song is a rapid series of notes followed by a lower-pitched series of shorter and more rapid notes—zit-zit-zit, etc., zi-zi-zi-zi,

etc. Another is in 3 parts, each higher or lower than the preceding series. The first part is a trill, then a double-noted *chipa-chipa*, etc., followed by a rapid series of single notes. In flight it utters a series of sharp double notes—zeep-zeep.

NEST: In sphagnum moss, under a sedge tussock, or on the ground under a small shrub; made of coarse sedge and grass lined with finer grass; invariably well hidden. The 5 or 6 white eggs (.60 x .47) are speckled with brown.

RANGE: (M.) Breeds from Anticosti Island, c. Quebec, n. Manitoba, and c. Yukon south to n. Maine, n. New York, n. Michigan, s. Manitoba, and s. British Columbia. Migrates east of the Rockies and in spring chiefly west of the Appalachians. Winters from s. Mexico south to Colombia and Venezuela.

Orange-crowned Warbler* *Vermivora celata*—#30

IDENTIFICATION: L. 5. These birds are characterized by their dull olive-green color, slightly lighter and yellower below than above. The under parts always show indistinct dusky streaking. The concealed orange crown patch is valueless as a field mark. In fall when the birds are a dusker olive there is usually little difference between upper and under parts.

HABITS: In the Arctic this bird breeds as far north as dwarf woody growths occur along stream bottoms. Throughout its range it strongly prefers thickets and does most of its foraging at moderate heights. It frequents dense new growths on cutover lands, is found in open woodlands where underbrush is heavy, and is especially attracted to steep shaded slopes and streamside thickets. In the northern states it is a late fall migrant.

VOICE: The song is a varied, rather musical short trill. The opening notes are often slow, followed by a more rapid

series higher in pitch. At the end the notes decrease in volume and rise or fall in pitch as they become richer in tone. Call note a sharp *chip*.

NEST: On the ground under a bush, more rarely in a shrub or tree; a cup of long, coarse grass and bark fiber, lined with fine grasses, moss, downs, feathers, and fur. The 5 white eggs (.63 x .49) are finely spotted with reddish-brown.

RANGE: (P.M.) Breeds from n. Manitoba, n. Mackenzie, and n.w. Alaska south to s. Manitoba, New Mexico, and n. Lower California. Winters from South Carolina, Arkansas, s.c. Texas, and s. California south to s. Florida and Guatemala. Found east in migration to Massachusetts, especially in late fall.

Nashville Warbler*

Vermivora ruficapilla—#22

IDENTIFICATION: L. $4\frac{3}{4}$. The clear, bright yellow under parts and gray head of spring adults are distinctive. The white or buffy eye ring is a good character, but the chestnut crown patch is hard to see and is often lacking in the female. In fall adults and immatures the head is brownish, the back grayer, and the breast tinged with brown.

HABITS: This bird is an inhabitant of one of the earlier of the many successive stages through which land passes as it returns to forest after being clear-cut, burned, or abandoned for agriculture or grazing. Such an area is at the right stage for Nashvilles when clumps of young trees, especially birches, are 10 to 12 feet high and plenty of low brush cover is available. Once established, the bird usually persists as a breeder until the trees have formed a woodland with an overhead canopy which excludes sunlight and kills the brush. The Nashville is one of the many birds that has prospered through man's activities, but it continues to occur, as it must always have done, on undisturbed lands where because of either swampy conditions or aridity trees are present only in scattered clumps interspersed with

brushy areas. In migration they feed in the tall treetops as well as in the lower growths, their normal foraging grounds. On the breeding grounds the song is usually given from a perch in or near the top of a small tree.

VOICE: The common 2-part song is pleasingly musical. The first half is a series of several 2-note phrases followed by a trilled series of lower, short, single notes that fade toward the end.

NEST: On the ground, hidden at the base of a shrub or stump or worked into the side of a mossy hummock; made of grasses, moss, and leaves lined with fine grass, pine needles, rootlets, or similar material. The 4 or 5 white eggs (.61 x .48) are speckled with brown, usually in a wreath.

RANGE: (M.) Breeds from Cape Breton Island, s. Quebec, c. Ontario, and c. Saskatchewan south to Connecticut, n. Pennsylvania, n. Illinois, and Nebraska. Also s. British Columbia south to s. California and east to Idaho. Winters from s. Florida and s. Texas to Guatemala.

Parula Warbler

Compsothlypis americana—#25

IDENTIFICATION: L. $4\frac{1}{2}$. The adult male is unmistakable. Fall males, females, and immatures have increasing amounts of green washed over the blue and less of a band across the yellow breast.

HABITS: This warbler is most commonly found breeding in the vicinity of swamps, ponds, and lakes, around woodland openings, or other areas where trees are festooned with either Spanish moss or usnea lichen, but it may occur anywhere in wooded areas. The species is insectivorous and does most of its feeding in treetops.

VOICE: The song is a wheezy or buzzy high-pitched ascending trill ending abruptly with a louder, explosive final note. The trill may or may not be preceded by a few even-pitched staccato notes of the same distinctive quality.

NEST: At varying heights from rather low to 50 or more feet up. In the North the nest is always in the center of a hanging tuft of usnea lichen, commonly known as "old man's beard moss." In the South, Spanish moss, which has a similar manner of growth, is used. In both cases the living "moss" is woven into a basketlike nest which is sparingly lined. Where no hanging moss is available the bird is generally rare as a breeder, but it does occur in hemlocks and spruces, the drooping twigs of which will support a woven basketlike nest of grasses, bark shreds, and downs. The 4 or 5 white eggs (.67 x .48) are speckled and spotted with browns.

RANGE: (M.) Breeds from Anticosti Island, c. Ontario, n. Minnesota, and e. Nebraska south to c. Florida, the Gulf Coast, and s.c. Texas. Winters from c. Florida and the Bahamas south to Barbados and from s. Mexico to Nicaragua.

Pitiayumi Warbler

Comptosblypis pitiayumi—#25

IDENTIFICATION: L. $4\frac{1}{2}$. The almost black areas along the sides of the face and the absence of a distinct band across the breast are good field marks. Other differences from a parula are the shorter wing bars and the lack of white around the eye. Females are greener and duller.

HABITS: This bird is found in dense woodlands and thickets along river bottoms. It does most of its feeding in the tops of the tallest trees and would be hard to find were it not for its song.

VOICE: Similar to that of a parula warbler.

NEST: Anywhere from 8 feet to well up in a treetop. The nest is built into a clump of hanging moss or other air plant, the fibers of which are woven together to make the nest cup. The 3 or 4 white eggs (.60 x .45) are speckled and spotted with brown.

RANGE: (R.) Occurs from extreme s. Texas south to Brazil.

Yellow Warbler*Dendroica petechia*—#21

IDENTIFICATION: L. 5. This is our only bird which has an all-yellow appearance in the field. Males of some tropical American races, including that of the Florida Keys, have a reddish-brown patch on the top of the head. Females and immatures are a darker, more greenish-yellow above and paler below with fewer streaks—sometimes none. Juveniles are pale olive-brown above with yellow-edged dark brown wings and pale, plain yellow under parts.

HABITS: The yellow warbler frequents lowlands grown up to scattered small trees or dense shrubbery. Its common wild haunts are willows and alders along streams and ponds, but it is almost equally at home in orchards, gardens, hedge-rows, and shade trees. In the Far North and in dry western grasslands it nests wherever small patches of woody plants persist in sheltered areas or low spots.

VOICE: This bird has a sweet, high-pitched, musical voice. The song is generally a series of about 4 introductory *weet* or *sweet* notes followed by a variable ending, which is sometimes a descending series of notes; at other times it drops at first and ends high. The goldfinch-like quality of the ending is distinctive.

NEST: Generally from 3 to 5 feet aboveground, occasionally higher; placed in an upright fork of a small tree or shrub. The nest has a deep foundation and is solidly built of long bark and plant fibers and grass and plant downs; it is lined with similar material. If a cowbird places an egg in the nest, the yellow warbler often covers it with a new nest cup and lays a fresh clutch. The 4 or 5 blue-white eggs (.70 x .50) are thickly speckled with brown.

RANGE: (P.M.) Breeds north to the limit of trees and from coast to coast from n. Quebec, n. Ontario, n. Mackenzie, and n.c. Alaska south to n. South Carolina, n. Alabama, s. Missouri, and c.w. Texas on south through Mexico to

n. Colombia. Also in the Florida Keys and throughout the West Indies. Winters from s. Mexico to Peru and east to the Guianas and Brazil.

Magnolia Warbler

Dendroica magnolia—#26

IDENTIFICATION: L. 5. In all plumages the black band on the end of the largely white tail is distinctive. The breeding female is a less brilliant counterpart of the male, and in the quite different fall plumage adults and immatures are much alike. Juveniles are brown above, grayish and yellow below with brown streaks.

HABITS: Open stands of young conifers are the normal home, but scattered pairs are often found along woodland roads and about small, isolated openings in the forest. The species is generally abundant along swamps and shallow ponds where there are young trees. The second growth after a clean cutting of spruce is generally well suited to its needs, as are neglected pastures with scattered clumps of trees. Even in migration magnolias feed at rather low levels and tend to stay hidden inside a tree.

VOICE: The short, musical song begins with 2 slurred 2-note phrases followed by a variety of higher- (occasionally lower-) pitched endings. The whole suggests *weeta, weeta, weete* or *weeta, weeta, weeto*.

NEST: In spruce, fir, or hemlock at almost any height but generally between 5 and 15 feet up. The loosely constructed shallow nest is made of twigs, plant stems, and grass and lined with black rootlets. The 4 white eggs (.65 x .48) are variably spotted or blotched with brown.

RANGE: (M.) Breeds from Newfoundland, c. Quebec, c. Manitoba, and s.w. Mackenzie south to n. Massachusetts, Virginia (mts.), n. Michigan, s. Saskatchewan, and c. Alberta. Winters from s. Mexico to Panama.

Cape May Warbler*Dendroica tigrina*—#28

IDENTIFICATION: L. 5. The handsome spring male is unmistakable, but in fall its bright colors are obscured by the feather tips—grayish above, white below. Females and immatures are much alike, with streaked under parts varying from white to yellowish. Their best field marks are the yellow to yellow-green rump, the light, often quite yellow, patch on the neck behind the ear, and the line over the eye.

HABITS: The Cape May is a bird of the mature spruce-fir forests of the North. It seems to prefer open parklike stands or those in which patches of birches occur. It feeds in low shrubbery and in treetops and in migration has an affinity for conifers. A favorite singing perch is the tip of a tall spruce. Its food consists chiefly of small insects, but in the fall it displays a great fondness for the juice of ripe grapes.

VOICE: The commonest song is a series of 6 to 12 identical staccato notes on the same high pitch and of even loudness. The quality is thin and rather buzzy. Other songs are composed of short 2-note phrases like those of a black and white warbler or are in several parts on different pitches like those of a Tennessee.

NEST: From 30 to 60 feet aboveground, hidden a few feet from the top in a spruce or fir. The bulky, compact nest is made of sphagnum moss held together with vines and twigs; it is lined first with grass, then with fur, feathers, and rootlets. The 4 white eggs (.65 x .50) are spotted and blotched with reddish-brown.

RANGE: (M.) Breeds from New Brunswick, n. Ontario, and s. Mackenzie south to n. New Hampshire and s. Manitoba. Winters in the West Indies, chiefly in the Greater Antilles and Bahamas.

Black-throated Blue Warbler

Dendroica caerulescens—#27

IDENTIFICATION: L. $5\frac{1}{4}$. The small square white patch on the wing is the best character. Fall and immature males have the blue washed with green, the black flecked with white. Immature females are greenish above and washed with dusky yellow below; their white wing patch may be largely concealed.

HABITS: This warbler occurs during the breeding season in deciduous and mixed woodlands, provided they have a thick, shrubby undergrowth. Steeply sloping land with a ground cover of laurel or yew seems especially attractive. In migration they commonly stay close to the ground.

VOICE: There is considerable variation in the songs of this bird. The commonest is a series of 3 to 5 long, slow, husky notes on the same pitch, ending with a drawn-out, slurred, rising note—*quee, quee, quee, quee, quee-e-e-e*.

NEST: From a few inches to 3 feet aboveground in a shrub, tree or seedling, rank weed, or fallen branch. The nest cup is of fine bark shreds, grass, leaves, and often rotten wood, bound together with cobwebs and lined with black rootlets and hair. The 4 white eggs (.68 x .50) are variously marked with browns.

RANGE: (M.) Breeds from s. Quebec, c. Ontario, and n. Minnesota south to n. Connecticut, n. Georgia (mts.), s. Ontario, n. Michigan, and c. Minnesota. Occurs west to Kansas in migration. Winters from the Florida Keys and Bahamas through the Greater Antilles and in Guatemala and Colombia.

Myrtle Warbler

Dendroica coronata—#27

IDENTIFICATION: L. $5\frac{1}{2}$. The bright yellow rump and the yellow patches on the sides of the breast are the best field

marks in all plumages. In fall an occasional immature female lacks the yellow breast patches.

HABITS: The myrtle is the most abundant northern warbler and wanders farther north than any other. It breeds throughout northern coniferous woodlands, showing preference for the more open stands and the borders of clearings. In migration myrtles occur everywhere and are especially abundant in brushy areas, hedgerows, field borders, and weedy tangles. When insects are not available they live on seeds and berries. Fruits of wax myrtle, bayberry, red cedar, and poison ivy are staple winter foods. At feeding shelves they are attracted by doughnut crumbs, suet, and sunflower seeds.

VOICE: The common song during migration is a jumbled series of 6 to 15 rapid, weak, and colorless notes varying irregularly in pitch. Later it has a song of 2-note phrases, the second note lower than the first, which usually trends upward in over-all pitch. The loud, harsh *tchip* call note is distinctive.

NEST: Generally in an evergreen from 5 to 50 feet up, most commonly about 15 feet. The loose, bulky nest is usually saddled on a limb part way out from the trunk. It is made of twigs, grasses, rootlets, moss, and plant fibers and is thickly lined with hair and feathers. The 4 or 5 white eggs (.70 x .52) are speckled or blotched with browns.

RANGE: (M.) Breeds from the northern limit of trees in c. Quebec, n. Manitoba, n. Mackenzie, n. Alaska, and e. Siberia south to Maine, n. New York, n. Michigan, s. Alberta, and n. British Columbia. Winters from New England, the Ohio Valley, Kansas, and on the Pacific coast from c. Oregon south to the Greater Antilles and Panama.

Audubon's Warbler

Dendroica auduboni—#27

IDENTIFICATION: L. 5. Differs from the myrtle warbler in having a yellow throat and white on 4 or 5 of the outer tail

feathers instead of on 2 or 3. Occasionally an immature female does not show yellow on the throat.

HABITS: This abundant warbler takes the place of the myrtle as a breeder throughout the coniferous forests of our western mountains, ranging up to timber line. In fall and winter they are found everywhere from shade trees and garden shrubbery to brushy hillsides, open lands, and ocean dunes. Their feeding habits at this time become quite varied as they fly-catch, forage on the ground, search flowers for nectar and insects, and eat seeds and fruits, including feeding-shelf raisins.

VOICE: The thin, colorless song starts with several slow notes followed by a more rapid jumble of short notes rising or falling in pitch toward the end. The *tsup* call note is softer than a myrtle's.

NEST: From a few feet to 50 or more aboveground, usually part way out on a horizontal conifer limb but occasionally in a deciduous tree or shrub; made of fine twigs, rootlets, and other plant fibers and lined with hair and feathers. The 4 grayish-white eggs (.72 x .54) are sparsely but boldly marked with brown.

RANGE: (P.M.) Breeds from w.c. Saskatchewan, c. Alberta, and c. British Columbia south to Guatemala and east to w. South Dakota and w. Texas. Winters from s. Texas and w. Washington south to Guatemala.

Black-throated Gray Warbler

Dendroica nigrescens—#29

IDENTIFICATION: L. $4\frac{3}{4}$. The black-and-white head pattern is distinctive. Females tend to be gray where the male is black, and their throats are often white. Fall birds are duller and slightly brownish on the back, the black markings somewhat obscured and the sides washed with brown.

HABITS: This warbler likes dense low growths interspersed with trees for singing perches. Otherwise it is tolerant of

a wide range of conditions. In the North it occurs in and about openings in the fir forest, where tree seedlings or other undergrowth are present. Throughout most of its range it favors dry slopes grown up to oaks, pines, junipers, and manzanita. Much of its feeding is done in the low chaparral.

VOICE: The song is a lazy, low-pitched lisping which sounds like a rolling *wee-zy, wee-zy, wee-zy, wee, zee*, with a final syllable slurred up or down and strongly accented.

NEST: At heights of from 3 to 50 feet. The higher nests in conifers are generally on a limb out from the trunk, while the lower ones in oaks or shrubs are usually in a clump of leaves. The nest is a cup of well-bleached plant fibers lined with fur and feathers. The 4 white eggs (.69 x .50) are brown-spotted.

RANGE: (M.) Breeds from n.w. Colorado and s. British Columbia south to s. New Mexico and n. Lower California. Winters south from s. Texas and s. Lower California through most of Mexico.

Black-throated Green Warbler

Dendroica virens—#28

IDENTIFICATION: L. 5. The bright yellow cheeks are a good field mark, especially with young females, which, lacking the black throat, might be taken for pine warblers. The very different juveniles are dull brown above, dull white below, dusky on the throat, and spotted on the breast and sides.

HABITS: The black-throated green is essentially a woodland warbler although it inhabits old cedar-grown pastures and second growths. It is widely distributed and occurs in all types of forests but prefers open stands of large trees. Pines and hemlocks attract it, as do bog communities of spruce and larch. The bird spends much of its time in the treetops and is hard to detect except by its song.

VOICE: In all its many forms the lazy, sibilant quality of the song is distinctive. Commonest is a series of about 6 identical high-pitched notes terminated by two lower notes—*zee, zee, zee, zee, zee, zee, so say*. Another common song consists of 4 or 5 notes, each on a different pitch.

NEST: From within a few inches of the ground to high up in a tree. The favorite site is among the branches of a conifer. The deep nest cup of grass, bark shreds, moss, fine twigs, and birch bark is bound together with cobwebs. The lining is generally of hair and feathers. The 4 or 5 white eggs (.65 x .46) are spotted and scrawled with browns.

RANGE: (M.) Breeds from Newfoundland, c. Quebec, c. Ontario, s. Manitoba, and c. Alberta south to coastal South Carolina, the mountains of n. Georgia and Alabama, n. Ohio, s. Wisconsin, and s. Minnesota. Winters from n.e. Mexico south to Panama, less commonly from s. Florida through the West Indies.

Golden-cheeked Warbler *Dendroica chrysoparia*—#28

IDENTIFICATION: L. 5. The black in the upper parts of both sexes, solid in the male and streaked in the female, is distinctive. Immature females resemble those of the black-throated green but lack yellow on the under parts.

HABITS: This warbler, rare in terms of total range, is common in its chosen habitat—the dry upper slopes and ridges of the Edwards Plateau. Here it occupies a dwarf forest of cedar and oak, in which it seems especially attracted to the neighborhood of isolated old cedars which dominate the lower scrub oak.

VOICE: A high-pitched sibilant song, usually short and hurriedly delivered. Often written as *tweah, tweah, twee-sy*.

NEST: From 6 to 20 feet up in an upright fork of a tree, generally an old cedar; made of shredded cedar bark, grass,

and rootlets, with some cobweb material; lined with hair and feathers. The 4 white eggs (.66 x .51) are finely speckled with brown.

RANGE: (M.) Breeds in the Edwards Plateau of s.c. Texas. Winters from s. Mexico to Nicaragua.

Cerulean Warbler

Dendroica cerulea—#25

IDENTIFICATION: L. $4\frac{1}{2}$. The bluish male, with a narrow blackish line across the breast, is easily recognized. The female is dull blue-gray only on the head, the back being strongly greenish. Immatures resemble fall blackpolls but are brighter green above and less extensively yellow below.

HABITS: The cerulean, a treetop warbler, is partial to open stands of large trees. It is not a uniformly distributed species and tends to occur in small, widely scattered colonies in especially favorable spots. Old riverbank woodlands seem to be one of these. Its habits make it hard to see, but it is an incessant singer.

VOICE: A common song is a husky, rolling series of 4 or 5 short notes on the same pitch followed by a higher-pitched trill. This final trill is generally all on the same pitch but may rise like a parula's. It can be written *tse, tse, tse, tse, te-e-e-e-e-e*.

NEST: Twenty-five to 60 feet aboveground on a lower branch of a tall tree, generally on a branch that hangs well out over an opening. The shallow nest is neatly woven of bark fibers or old weed stalks and lined with moss stalks or hair. The 4 whitish eggs (.60 x .47) are variably marked with brown.

RANGE: (M.) Breeds from s. New York, s. Ontario, s. Wisconsin, s. Minnesota, and s.e. Nebraska south to Delaware, n. Georgia, c. Alabama, Louisiana, and n.e. Texas. Winters from Venezuela to c. Peru.

Blackburnian Warbler*Dendroica fusca*—#26

IDENTIFICATION: L. $5\frac{1}{4}$. Females and fall males are marked like the vivid spring males, but the orange areas are duller or replaced by yellow and the black areas are masked by brown feather tips. Immatures have pale yellow in place of orange and are indistinctly streaked on the sides. The large amount of white in the tail is a good field mark in all plumages.

HABITS: Tall timber is the normal home. The bird is found in deciduous and coniferous forests but is generally most abundant in mixed woodlands with large hemlocks, spruces, or pines. Most feeding is high up in the forest canopy, and the males sing from treetop perches. Like many warblers, these are apt to be found in various habitats in migration, but treetops remain the best place to look for them.

VOICE: The song is variable in form and has considerable tone range, some of the notes being very high-pitched. The thin, wiry quality is distinctive. The general form is first a series of 4 double notes followed by a trill or a rapid run of short notes. The ending may be higher or lower in pitch and is occasionally slurred upward.

NEST: Anywhere from 6 to 60 feet up, generally in a large conifer and usually well out on a branch; made of fine twigs and soft plant down or usnea lichen, lined with bark shreds, rootlets, and occasionally hair. The 4 white eggs (.68 x .50) are spotted and blotched with rich browns.

RANGE: (M.) Breeds from Cape Breton Island, c. Quebec, c. Ontario, and c. Manitoba south to Connecticut, n. Georgia (mts.), n. Michigan, and c. Minnesota. Winters from Yucatan and Venezuela to c. Peru.

Yellow-throated Warbler* *Dendroica dominica*—#25

IDENTIFICATION: L. $5\frac{1}{4}$. Females of this gray-backed bird differ from males in having slightly less black about the head. All fall birds are washed with brown above and below.

HABITS: The big timber of bottom lands, swamps, and river-banks is a common habitat. The bird is especially frequent in stands of old sycamore and cypress. Mature pines in open stands or in mixed woods may be inhabited, but here the distribution is usually irregular. In the South it seems attracted by any woodland where Spanish moss drapes the trees. The birds stay in the treetops and are rather deliberate in movement as they creep along the upper limbs thoroughly searching each spot before moving on.

VOICE: The song has many variations but is generally fairly loud and musical. A common form is a series of clear double syllables that run down the scale and grow fainter, ending on an abrupt higher note. Others with more variation in pitch suggest the indigo bunting.

NEST: From 20 to more than 100 feet up on a horizontal limb of a large tree except where Spanish moss occurs, then invariably in a hanging clump of it near the end of a limb; made of bark shreds and grass lined with downs, feathers, and hair. The 4 dull greenish-white eggs (.69 x .52) are blotched with purplish and brownish marks.

RANGE: (P.M.) Breeds from s. New Jersey, Maryland, Ohio, s. Michigan, s. Wisconsin, and s.e. Nebraska south to c. Florida, the n. Bahamas, the Gulf Coast, and c. Texas. Winters from e. South Carolina through the Bahamas and Greater Antilles and from s. Texas to Costa Rica.

Sutton's Warbler* *Dendroica potomac*—#25

IDENTIFICATION: L. $5\frac{1}{4}$. The bright yellow throat and breast bordered with black on the side neck, together with the

blue-gray upper parts and greenish back patch, separate this from other warblers. The female is much like the male except that the black markings are restricted.

HABITS: One of the two known specimens was collected on a dry hillside dominated by scrub pine mixed with oak, the other 18 miles away in a wet willow-sycamore woodland. The bird was unknown until these specimens were obtained in late May of 1939: the male 12 miles s.e. of Martinsburg, the female 4 miles n.w. of Shepherdtown, West Virginia. Little more is known except for subsequent sight records from the same area and a bird reported in migration near Tampa, Florida, in September 1944. Further collecting is forbidden.

The chances that this is a hybrid between two well-known species seem remote, but it is amazing that so striking a bird could so long remain undetected in a well-studied region like eastern North America. This lends support to the possibility that Audubon's carbonated warbler, collected at Henderson, Kentucky, in 1811 and figured on plate №60 of the elephant folio, may still exist. The same may be true of two other mystery warblers—the Blue Mountain and the small-headed. The first was described and illustrated by Wilson (plate №44) from specimens taken near the Blue Ridge of Virginia, close to where Sutton's warbler was found. The other, which Wilson called the small-headed flycatcher, was collected by him in New Jersey and Pennsylvania and by Audubon in Kentucky.

VOICE: Described as a rapid, buzzy, parula-like trill ascending the scale, then dropping abruptly to a lower pitch just before the end. The whole is repeated twice in rapid succession without a break.

NEST: Unknown.

RANGE: (M.) Apparently breeds in the n.e. "panhandle" of West Virginia but may occur in adjacent parts of Pennsylvania, Maryland, and Virginia.

Chestnut-sided Warbler**Dendroica pensylvanica*—#28

IDENTIFICATION: L. 5. The female is duller than the male, and the brown stripe is narrower or broken. Fall adults and immatures are much alike except that young birds lack any brown. In fall plumage the clear yellow-green of the upper parts, the white eye ring, and white under parts are distinctive.

HABITS: This warbler, which a hundred years ago was so rare that Audubon saw it but once, is now abundant. The brushy sprout growth that follows clear-cutting and the early stages of forest regeneration on abandoned farm- and pasturelands afford it ideal habitat. When the young trees finally form a dense second-growth woodland with a closed canopy the bird vanishes from the area.

The brief period that an area remains suitable illustrates the instability of bird populations on other than forested areas. In general, birds that do not inhabit deep woodlands are throughout the normally forested part of the continent dependent on man or fire to create their required habitats. Furthermore, in the absence of continuing or repeated disturbance, each species' tenure of an area is limited to the time it takes the plant community to mature into the succeeding stage of its transformation into forest. Thus weeds follow grass, brushland follows weeds, open second growth comes next, and so on, with each stage providing the habitat for a different set of birds.

VOICE: This warbler has a loud, clear, musical song not unlike a yellow warbler's. The spring song is a series of about 5 2-note phrases ending with a strongly accented phrase that starts high and is slurred down—like *tawee, tawee, tawee, tawee, ta-wee'-cha*. The less distinctive, more variable summer song is a longer run of slurred 2-note phrases that generally falls in pitch.

NEST: About 2 or 3 feet up in a shrub or small tree; a loosely built cup of grass, weed stalks, plant downs, and bark shreds lined with fine grasses, rootlets, and hair. The 4 white eggs (.69 x .50) are marked with brownish spots of varying size.

RANGE: (M.) Breeds from Newfoundland, s. Quebec, c. Ontario, c. Manitoba, and c. Saskatchewan south to n. New Jersey, n. Georgia (mts.), n. Ohio, Illinois, s. Missouri, and e. Nebraska. Winters from Guatemala to Panama.

Bay-breasted Warbler

Dendroica castanea—#29

IDENTIFICATION: L. $5\frac{1}{2}$. The richly colored males with conspicuous, buffy neck patches and the similarly marked but less extensively brown females are easily identified. Fall adults usually show a trace of brown on the sides, but immatures are much like blackpolls, except that they are a brighter, clearer green above with fewer dark streaks, have yellower wing bars, are buffier, and (at most) are very distinctly streaked below. Feet and legs are darker than the blackpoll's, but the surest mark is the buffy color of the under-tail coverts.

HABITS: This warbler is an inhabitant of spruce woodlands of the Canadian zone. Like so many species, it is attracted to small forest openings with a scattered growth of vigorous young trees. It is often common along the borders of clearings and in overgrown pastures and lumbered-off areas dominated by 6- to 10-foot trees. The borders of bogs and ponds also provide breeding grounds. The birds feed at all heights and are rather deliberate in movement. The bulk of them go south in fall considerably ahead of the blackpolls which they so closely resemble at this time of year.

VOICE: The common song in migration is an irregular series of notes of varying length on the same high pitch, thin and sibilant but rather pleasant. They have more varied songs

on their northern breeding grounds. One starts like the preceding but ends in a warble.

NEST: On a limb or against the trunk of a conifer at heights of from 4 to more than 40 feet; loosely built of twigs, grass, and pine needles lined with rootlets and hair. The 5 white eggs (.72 x .52) are covered with brown markings of varying size.

RANGE: (M.) Breeds from Newfoundland, n. Ontario, c. Manitoba, and e.c. Alberta south to Maine, n. New York, n. Michigan, and n. Minnesota. Winters from Panama to Colombia.

Blackpoll Warbler

Dendroica striata—#29

IDENTIFICATION: L. 5½. The black-capped spring male is easily identified. The spring female lacks the cap and is somewhat greenish above, slightly yellowish below, and lightly streaked. In fall adults and young are alike. They differ from young bay-breasteds in being a duller green more thickly streaked with black above and in being yellowish rather than buffy below, with definite side streaks. The legs and feet are paler, and the belly and under-tail coverts are pure white.

HABITS: This abundant warbler is commonest in treetops in migration and is the latest of the spring migrants. Its breeding grounds are among the dwarfed spruces and firs of the northern part of the coniferous forest. Farther south it occurs chiefly where high altitudes or oceanic winds or bog conditions have created areas of stunted spruce and fir.

VOICE: The song is a series of 12 or more short, sibilant, staccato notes on the same high pitch; readily identified by the way it gradually increases in volume until the middle is reached and then fades out at the end.

NEST: Generally 4 to 12 feet up in a small conifer, occasionally on the ground; loosely made of grasses, twigs, root-

lets, and moss, often with feathers in the lining. The 4 or 5 white eggs (.70 x .54) are spotted and blotched with browns.

RANGE: (M.) Breeds from the northern limit of trees in Newfoundland, n. Quebec, n. Manitoba, n. Mackenzie, and n.w. Alaska south to n. Maine, s.c. New York (Catskills), n. Michigan, s. Manitoba, and n. British Columbia.

Winters from the Guianas and Venezuela to Brazil.

Pine Warbler

Dendroica pinus—#30

IDENTIFICATION: L. $5\frac{1}{2}$. The male is not unlike a yellow-throated vireo in color but has a greenish rump, a faintly streaked breast, which is not as clear or as bright a yellow as the vireo's, and a line over the eye instead of yellow spectacles. Females and immatures are a plain, almost olive-brown above and are often dingy white below, with little if any trace of yellow.

HABITS: This bird is well named, as it is nearly always associated with pines. The birds feed on insects, searching the trees from top to bottom like creepers, and do some feeding on the ground. Pine seeds supplemented by other seeds and berries are staple winter foods.

VOICE: The song is a run of short notes varying slightly in pitch and almost rapid enough to be called a trill. It is like a chipping sparrow's but softer, lower-pitched, and not so rapid.

NEST: From 10 feet aboveground to the tops of the tallest trees, usually concealed in foliage out on a horizontal limb; made of bark strips, weed stems, twigs, and pine needles held together with silk and lined with fur and feathers. The 4 white eggs (.70 x .52) are wreathed with brown spots.

RANGE: (P.M.) Breeds from New Brunswick, s. Quebec, s. Ontario, n. Michigan, s. Manitoba, and c. Alberta south to s. Florida, the n. Bahamas, Hispaniola, and the Gulf

Coast to e.c. Texas. Winters from Virginia and s. Illinois south to Florida and into n.e. Mexico.

Kirtland's Warbler

Dendroica kirtlandii—#24

IDENTIFICATION: L. $5\frac{3}{4}$. This large, tail-wagging warbler is not easily confused with any other. Females are slightly duller than males, paler, and less sharply marked with black. In fall adults and young are strongly washed with brown above and on the sides.

HABITS: The only place this warbler seems willing to nest is in an open stand of young jack pines averaging 6 to 12 feet in height; it is therefore not likely to find any area suitable for more than a few years. Here we seem to have a species so dependent upon recurring fires for the creation of suitable habitat that it might conceivably be exterminated by rigid fire suppression over its very limited range. Although known as a breeder only from Michigan, it should be looked or listened for in similar jack-pine country in other areas.

VOICE: The song is a rapidly articulated jumble which suggests the songs of the northern water-thrush and the house wren. Its outstanding characteristics are its loudness (carries $\frac{1}{4}$ mile at times), its liquid, bubbling quality, and the lively, emphatic manner in which it is delivered. Lower-pitched than the song of any other eastern *Dendroica*, it starts low and rises to the end, becoming louder and faster as it progresses.

NEST: Sunk in the ground and well concealed, usually in a clump of small pines in an opening; made of strips of bark and weed fiber and lined with fine grasses, pine needles, and hair. The 4 white eggs (.72 x .56) are speckled with fine brown spots.

RANGE: (M.) Breeds in n.c. Michigan. Winters in the Bahamas.

Prairie Warbler*Dendroica discolor*—#31

IDENTIFICATION: L. $4\frac{3}{4}$. The male is distinctively marked.

Females and immatures are similar, but the brown back patch is usually more or less obscured and the whole back washed with gray; the black side and flank streaks may be fainter or absent and the cheeks gray.

HABITS: This is not a bird of the prairie but of brushy land.

It seldom feeds high and is notably active—constantly tilting its tail and often fluttering its wings. A cutover woodland, after many of the stumps have sent up vigorous sprouts, exactly suits the prairie warbler for a few years. It also breeds on abandoned agricultural lands and pastures that are growing up to shrubs and young trees. Probably because of the unstable and temporary character of the plant communities it inhabits, its distribution is very spotty. Even on apparently suitable lands there may be a considerable year-to-year fluctuation. Only in a few areas are they reasonably permanent breeders. One is among the mangrove tangles that fringe the Florida coast and Keys. Another is in the oak-pine barrens on highly impoverished soils or on areas where recurring fires preclude the development of a more mature woodland.

VOICE: The rather loud and distinctive song is a long, ascending series of rapidly uttered short notes. The tone is pleasingly musical but buzzy.

NEST: Between 2 and 5 feet off the ground, occasionally up to 20 feet; usually concealed in dense leafy vegetation in a low thicket or out near a branch tip in a small tree. Made largely of plant downs, held together with grass and leaves, and lined with rootlets, hair, and feathers. The 4 white eggs (.63 x .47) are wreathed with brown spots.

RANGE: (P.M.) Breeds from Massachusetts, s. Ontario, n. Michigan, and e. Nebraska south to s. Florida, n. Missis-

sippi, and Arkansas. Winters from c. Florida south through the West Indies to Martinique.

Palm Warbler*

Dendroica palmarum—#31

IDENTIFICATION: L. $5\frac{1}{4}$. The constant tail wagging serves to identify this species in any plumage. Immatures sometimes lack the distinctive reddish-brown crown and may be yellow only on the breast. The palm warblers that nest in the Northeast are always more completely and more brightly yellow below.

HABITS: The summer home is about open spruce-tamarack bogs in northern woodlands. At other seasons it is widely scattered and often common about towns and gardens. It likes bare or open areas, as it spends much of its time feeding on the ground or in low vegetation. Insects are the chief food, but it can survive for some time on seeds and fruits, e.g., bayberry.

VOICE: The song is a weak but pleasant, rapid, trill-like run of 2-note syllables. They are on the same pitch, but there is usually an increase in volume at some point and often a few added twittery notes at the beginning and end.

NEST: On the ground in a hummock of moss or sedge under a small tree; made of grass and bark shreds, lined with rootlets and often feathers. The 4 or 5 white eggs (.63 x .50) are speckled or blotched with brown.

RANGE: (M.) Breeds from Newfoundland, c. Quebec, n. Ontario, and s. Mackenzie south to s. Nova Scotia, Maine, n. Michigan, n. Minnesota, and c. Alberta. Winters from South Carolina and the Gulf Coast to Puerto Rico and Yucatan, rarely from New Brunswick south along the coast.

Ovenbird**Seiurus aurocapillus*—*31

IDENTIFICATION: L. 6. This heavy-bodied warbler with its black-bordered, pale orange-brown crown patch and black-streaked, white under parts is the same in all but the juvenile plumage. Young are bright brown above and paler brown below, except for a white belly, and are streaked with black above and below.

HABITS: This is a bird of the forest floor and is generally evenly distributed through all reasonably mature woodlands. It is, as a rule, more abundant in dry woods not too thick with underbrush and other low growths. Most of its feeding is on the ground, but it uses a low branch for a lookout and singing perch. Many who know the bird well are unfamiliar with its wonderful flight song, which can be heard from May to September, most often in late afternoon or on moonlight nights, but sometimes in broad daylight or pitch dark.

VOICE: The common song is a series of 2-note phrases—*teacher, teacher, teacher, teacher, teacher*. The delivery is vigorous and the song, growing louder as it progresses, becomes very loud at the end. The flight song is an indescribable jumble of notes of various pitches, a combination of warble and twitter with, generally, a few *teachers* thrown in.

NEST: The completely arched-over nest with its side entrance is on the ground, usually in the open. It is constructed of dead leaves and plant fibers, lined with grass and hair. Usually it is so worked into the forest floor and covered with dead leaves like those around it that it is almost impossible to detect. The 4 or 5 white eggs (.79 x .63) are spotted with brown.

RANGE: (M.) Breeds from Newfoundland, c. Quebec, n. Ontario, and s.w. Mackenzie south to e. North Carolina, n.

Georgia, Arkansas, Colorado, and s. Alberta. Winters from e. South Carolina and the Gulf Coast south to the n. Lesser Antilles and through Mexico to Colombia.

Northern Water-thrush* *Seiurus noveboracensis*—#31

IDENTIFICATION: L. 6. The thrush-like appearance of the water-thrushes, their presence near water, and their habit of constantly teetering like the spotted sandpiper will always identify them. In both species the birds are much alike in all plumages. The northern differs from the Louisiana in its strongly yellow under parts and eyeline, its black instead of brownish streaks, and its uniformly streaked throat.

HABITS: The breeding grounds are the cool, shrub-grown bogs, wooded swamps, and lake shores of the North. Shaded surroundings and wet ground with open pools of shallow water seem necessary at this season. Here it feeds on aquatic insects, tiny mollusks and crustacea, worms, and occasionally fish. At other seasons it is found in a wider variety of habitats but continues to do most of its feeding on the ground. In migration it is frequently encountered in gardens and under tangles of shrubbery. In fall it leads the southward warbler flight.

VOICE: The song is a series of short, ringing, emphatic notes with a beautiful liquid quality. The series of 10 or 12 drops in pitch, often rather irregularly. There is also a speeding up of tempo toward the end.

NEST: In a cavity in a bank, on the side of a stump, or in the upturned roots of a fallen tree; made largely of green moss and lined with moss fruiting stalks. The 4 or 5 creamy-white eggs (.75 x .58) are finely speckled or heavily blotched with browns.

RANGE: (M.) Breeds from Newfoundland, n. Quebec, n. Ontario, n. Manitoba, c. Mackenzie, n. Alaska, and e.

Siberia south to n. New England, West Virginia (mts.), s. Ontario, n. Minnesota, n.w. Nebraska, c. Montana, and s. British Columbia. Winters from the Bahamas, s. Florida, the Valley of Mexico and Lower California south to Colombia and the Guianas.

Louisiana Water-thrush*

Seiurus motacilla—#31

IDENTIFICATION: L. $6\frac{1}{4}$. This, the larger of the two water-thrushes, has a white eyeline and white under parts, except that the sides and flanks are tinged with buff. The throat, but for a dark streak on the side, is unmarked.

HABITS: Where the breeding ranges overlap the Louisiana seems to prefer the vicinity of flowing streams, especially swift mountain brooks, while the northern prefers the quieter waters and pools of extensive low swamps or bogs. Farther south, the Louisiana is found in limited numbers in river-bottom lands near sluggish streams. In migration this is the shyer of the two species and is less commonly seen away from low, wet areas.

VOICE: The 2-part song is loud and forceful. It opens with 3 or 4 long, upslurred, rather slowly uttered notes, then breaks into a hurried jumble of short, almost explosive notes, some high, some low, but usually trending downward. The call note of both water-thrushes is a distinctive, loud, metallic *pink*.

NEST: In a cavity in a stump, among the roots of a tree, or, most frequently, in and under the overhang of a stream bank; made externally of dead leaves, then moss and twigs, and lined with grass, hair, or rootlets. The 5 white eggs (.75 x .60) may be plain or heavily blotched with brown.

RANGE: (M.) Breeds from Massachusetts, s. Ontario, s.e. Minnesota, and e. Nebraska south to c. South Carolina, n. Georgia, s. Alabama, and n.e. Texas. Winters from s. Florida and the Bahamas south to the Lesser Antilles and from n. Mexico to Colombia.

Kentucky Warbler*Oporornis formosus*—#23

IDENTIFICATION: L. $5\frac{1}{2}$. The solid olive-green upper parts and bright yellow under parts, together with the distinctive black head markings, make this bird easy to identify. Females and immatures generally have the black markings more or less obscured by greenish or yellow feather tips.

HABITS: The summer home is in the luxuriant forests of low, moist, rich bottom lands, ravines, and swamp borders. Here in dense shade and often among thick, low growths it spends most of its time on the ground but goes into the lower branches of a tree to sing.

VOICE: The loud song is a series of 5 or 6 clear, whistled, identical double syllables like *tur-dle, tur-dle*, etc. It suggests the even louder song of the Carolina wren and the songs of the tufted titmouse and ovenbird. It is a persistent singer.

NEST: On or just off the ground (never sunk into it) at the foot of a small bush or hidden in a patch of leafy vegetation. Generally it is in a comparatively open spot in the woods. It is made of dead leaves and is lined with rootlets, grass, and hair. The 4 or 5 white eggs (.73 x .56) are usually finely speckled with brown.

RANGE: (M.) Breeds from s.e. New York, s. Ontario, s. Wisconsin, s. Minnesota, and s.e. Nebraska south to North Carolina, n. Georgia, s. Louisiana, and e. Texas. Winters from s. Mexico to Colombia.

Connecticut Warbler*Oporornis agilis*—#22

IDENTIFICATION: L. $5\frac{1}{2}$. The conspicuous eye ring, white in adults, buffy in immatures, is the best field mark, although the under-tail coverts reaching almost to the end of the tail are distinctive. In females and young the gray hood is replaced by a less distinct brownish one, very

pale on the throat, but sharply defined where its border crosses the lower breast. This sharp line of separation differs from the gradual merging of breast and belly color in immature mourning warblers.

HABITS: In the southern part of its breeding range the Connecticut is encountered in open bogs with scattered tamaracks and spruces. Farther northwest, where it seems more abundant, it prefers brushy openings in upland poplar-aspen country. It is not particularly active and does most of its feeding on the ground or in low growths. In spring the birds, which are very late migrants, are found in brushy tangles in low or swampy woodlands. In fall they also occur among tall weeds, especially in moist areas. This warbler is seldom found unless definitely searched for in its special haunts.

VOICE: The song is a loud, shrill, penetrating series of identical 2- or 3-note phrases, suggesting a uniform repetition of the word *bee-cher* or the phrase *whip-pity*. It is something like a low-pitched yellow-throat song or an ovenbird's held at the same volume throughout.

NEST: On the ground, sunk into a mound of moss or in a hollow under a clump of grass; generally composed almost wholly of grasses. The 4 or 5 white eggs (.78 x .56) are usually boldly blotched with brown.

RANGE: (M.) Breeds in a narrow east-west belt along the southern edge of the northern coniferous forest zone from s. Ontario, n. Michigan, c. Minnesota, s. Manitoba to c. Alberta. Winters from n. Brazil to Colombia. In spring it migrates via Florida, moving directly northwest to its breeding grounds, but in fall it flies almost due east to the Atlantic coast before starting south.

Mourning Warbler

Oporornis philadelphia—#22

IDENTIFICATION: L. $5\frac{1}{2}$. Both sexes have gray hoods but differ from Connecticut warblers in the lack of an eye ring,

except for a more or less incomplete one in immatures. The male has a large black patch on the breast which is veiled by gray in the fall. Immatures have clear, but often pale, yellow throats and breasts which merge gradually with the bright yellow under parts.

HABITS: The essential habitat is an extensive, dense stand of shrubbery. The birds seldom leave such growths except to forage through near-by patches of coarse, rank weeds. Generally they stay well hidden, but the male regularly rises to the top of a bush or sapling to sing.

Mourning warblers are commonly found breeding in the zone of dense brush that commonly borders a bog or marshland and in the briary tangles of second growth that spring up on burned- or cutover forest lands. It is another of the many birds that have benefited from the bad forestry practices of the past century. Wilson, its discoverer, saw only one, Audubon very few, and Nuttall was never sure he saw it.

VOICE: The short, loud, musical song has 2 parts. The first consists of about 3 2-note phrases like *choree, choree, choree*, followed by 3 or 4 short, single notes uttered in rapid succession.

NEST: Usually on the ground but occasionally as high as 2 feet, and always in a tangle of briars, canes, weed stalks, or grass. The large nest is made of dead leaves and coarse fibers, then grass, and is finally lined with fine grass, rootlets, or hair. The 4 white eggs (.71 x .54) are generally rather evenly speckled with brown.

RANGE: (M.) Breeds from Newfoundland, c. Quebec, c. Ontario, c. Manitoba, and e.c. Alberta south to Maine, West Virginia (mts.), n. Michigan, and c. Minnesota. Winters from Nicaragua to Venezuela and Ecuador.

Macgillivray's Warbler*Oporornis tolmiei*—#22

IDENTIFICATION: L. $5\frac{1}{2}$. Males differ from mourning warbler males in their white eye spots, blacker lores, and grayer breasts. The longer tails and complete eye rings of immatures are not of much value in the field.

HABITS: Extensive brushy areas on moist ground are favored, but the species also breeds on fairly dry hillsides where vegetation is very dense. It is often abundant in the new growth that comes up in the tangled confusion of fallen treetops or slash piles in a burned- or cutover forest. Its impenetrable habitat plus its quiet, retiring habits make it hard to see.

VOICE: The song consists of 2 rapidly delivered runs of identical phrases, the first part usually higher in pitch, the second more liquid in quality—*sweet sweet sweet, peachy peachy peachy*.

NEST: Anywhere from almost on the ground to about 5 feet up in a shrub; raggedly and loosely made of weed stalks and grass with a lining of finer grass and rootlets. The 4 white eggs (.70 x .53) are spotted with brown and often faintly scrawled with black.

RANGE: (M.) Breeds from s. Saskatchewan, c. Alberta, c. British Columbia, and s.e. Alaska south to n. New Mexico and c. California and east to w. South Dakota. Winters from n. Mexico to Colombia. Occurs in migration casually to the Mississippi Valley and regularly to c. and s. Texas.

Yellowthroat*Geothlypis trichas*—#23

IDENTIFICATION: L. $5\frac{1}{4}$. The adult male keeps its black mask the year round. The female has a brownish forehead, paler yellow throat, a whitish eye ring, and under parts that are washed with brown—darkest on sides and flanks,

lightest on the white belly. Immatures are extremely nondescript, their throats sometimes being so buffy as to look hardly yellow at all. Their bellies, unlike those of similar warblers, remain fairly white, and the under-tail coverts are always quite yellow.

HABITS: This wide-ranging species varies considerably in appearance in different parts of the continent and has been divided into many subspecies. It is an active, inquisitive frequenter of dense, low cover on a variety of sites but is commonest near water and in the rank vegetation of marshy areas. Cattail, tule, and bulrush marshes, stream-side thickets of willows, and tangles of blackberries and weeds on old fields are common breeding habitats.

VOICE: The usual song is a short, vigorous series of clear, high-pitched, 3-note phrases, but there are variations with more notes. It is often written *witchity, witchity, witchity*. The flight song, delivered from a height of 10 to 15 feet, is a rapid jumble of short notes with an occasional *witchity* worked in.

NEST: On the ground or a short distance above it in a dense clump of coarse vegetation; always among or attached to the stems of the plants. The loose, bulky structure is made of grasses, sedges, and bark strips with a lining of finer grasses, rootlets, or hair. The 4 white eggs (.71 x .54) are variably spotted with browns and black.

RANGE: (P.M.) Breeds from Newfoundland, s. Quebec, c. Ontario, c. Alberta, and s.e. Alaska south to s. Florida, the Gulf Coast, and s. Mexico. Winters from North Carolina, Louisiana, n. Mexico, and c. California south to Puerto Rico and Costa Rica.

Mexican Ground-chat *Chamaethlypis poliocephala*—#23

IDENTIFICATION: L. 5½. The black-lored males with slaty heads washed with olive are unmistakable. Females and

young are often nondescript, but their stout, strongly down-curved bills distinguish them at once from yellowthroats.

HABITS: Dense stands of tall, coarse grasses seem to be essential. Scattered shrubs for singing perches are also important. Thickets, weed-grown fields, and fernbrakes are less frequent habitats. Very little is known about this bird, and chances to learn more should not be missed.

VOICE: The short song is a low-pitched, rather pleasant warble.

NEST: A foot or 2 from the ground in dense vegetation, usually in a clump of coarse grass; made of grasses with a lining of finer grasses and often hair. The 4 creamy-white eggs (.69 x .55) are lightly marked with brown.

RANGE: (R.) Occurs from extreme s. Texas and n.w. Mexico south to Panama.

Yellow-breasted Chat*

Icteria virens—#23

IDENTIFICATION: L. $7\frac{1}{2}$. The chat is classified as a warbler, but its large size, heavy bill, unwarbler-like behavior, and loud voice set it apart from its kind. Immatures and adults are almost identical.

HABITS: The chat is a bird of dense shrub and vine tangles scattered with young trees. In pre-settlement days it was probably found chiefly on streamsides and pond borders, but now it also inhabits the young growth on cut- or burned-over forest land, old pastures, and abandoned fields. Few birds are harder to see or easier to detect by ear. The song is usually given as the bird moves about inside the crown of a tree or a dense thicket. Occasionally it jumps into the air and, flying slowly or hovering with dangling legs and deep wingbeats, pours out a flood of sound. It supplements its normal warbler diet of insects with considerable fruit.

VOICE: Instead of singing in the ordinary sense, the chat utters a disjointed series of noises, often at widely spaced intervals—whistles, mews, scolds, trumpeting sounds, squeaks, and cackles, delivered singly or repeated several times in rapid succession. The performance is unmistakable, and several of the sounds are absolutely distinctive.

NEST: From 3 to 5 feet aboveground in a small tree, clump of bushes, or vine tangle. The bulky nest is made of dead leaves, grasses, and bark shreds with a lining of finer grass. The 4 white eggs (.86 x .66) are variably but evenly spotted with brown.

RANGE: (P.M.) Breeds from Connecticut, s. Ontario, Iowa, Montana, and s. British Columbia south to n. Florida, the Gulf Coast (where it is rare), and e. Mexico. Winters from n. Mexico south to Costa Rica.

Hooded Warbler

Wilsonia citrina—#23

IDENTIFICATION: L. 5½. Males need no description. Females generally show a trace of black about the head, but immatures are quite plain. Their best field marks are their broad yellow forehead and the white in the tail.

HABITS: A mature woodland in a low, moist site which favors well-developed shrubbery is a typical haunt. In the South hooded warblers are common in heavily forested swamp-land with a dense tangle of shrubs. In the North cool stream bottoms and ravines are favorite breeding grounds. The bird does most of its feeding in the lower strata of the forest, chiefly under 10 feet, but is not often seen on the ground. It is an expert flycatcher and a generally active bird, with a trick of snapping its tail open and shut, revealing the white areas.

VOICE: The short song is loud and clear with a rich, ringing quality. It consists of a series of identical 2-note phrases followed by a closing phrase that falls in pitch, suggesting the syllables *peet-to, peet-to, peet-to, weet-too*.

NEST: Usually between 2 and 3 feet up in a fork in a shrub or small tree; made of dead leaves held together with plant fibers and spider webs; neatly lined with grass and fine bark shreds. The 3 or 4 creamy-white eggs (.69 x .55) are spotted with brown.

RANGE: (M.) Breeds from Connecticut, c. New York, s. Michigan, n. Iowa, and s.e. Nebraska south to n. Florida and the Gulf Coast west to Louisiana. Winters from s. Mexico to Panama.

Wilson's Warbler

Wilsonia pusilla—#21

IDENTIFICATION: L. 5. Many females are black-capped like males. Immatures often lack any trace of cap and are best distinguished by their yellow foreheads and big, black, beady eyes which stand out against the bright yellow cheeks.

HABITS: The Wilson's warbler has an extraordinarily broad north-south range, breeding from the shores of the Arctic Ocean south almost to Mexico. Its habitat preferences are much the same everywhere—low, shrubby growths in open, moist areas along streams and ponds or in bogs and brush-grown swamps. Willows and alders are the plants with which it is most often associated. Although it is one of the most active of all warblers and engages in much fly-catching, it usually stays within about 10 feet of the ground.

VOICE: The song is a weak, chattery series of short, rapidly uttered notes, usually all on the same pitch until near the end, when they generally drop in tone and may increase or decrease in volume.

NEST: On the ground, well hidden in a moss hummock, or under a sedge tussock in a moist, shrubby area or a few feet up in dense vegetation. The bulky nest is often almost a ball of leaves, moss, grass, and rootlets, with a lining of

fine grass and hair. The 4 white eggs (.64 x .49) are spotted with browns.

RANGE: (M.) Breeds from Newfoundland, c. Quebec, n. Manitoba, n.w. Mackenzie, and n. Alaska south to Nova Scotia, n. New Hampshire, n. Minnesota, s. Saskatchewan, c.w. Texas, and s. California. Winters from n. Mexico to Panama.

Canada Warbler

Wilsonia canadensis—#24

IDENTIFICATION: L. 5½. Immatures lack the necklace, but the yellow spectacles and solid gray upper parts are distinctive.

HABITS: The usual home is in the luxuriant undergrowth of mature woodlands. The bird likes cool, moist areas and is found about swamp borders and in streamside shrubbery. Like the preceding species, it is a very active fly-catching warbler and does most of its feeding near the ground. In migration it frequents brushlands and young second growth in clearings. In the North it occasionally breeds in such areas if they are sufficiently moist.

VOICE: The song is loud, rich, and strongly accented but hard to describe, as it is an irregular series of notes, varying in length and pitch. Often they are slurred together to produce phrases that suggest the yellowthroat's *witchity*.

NEST: On or near the ground, well concealed in a mound of moss, a rotten stump, the upturned roots of a fallen tree, or under a fern clump. The locality is generally moist, and the nest is sometimes above water. It is generally a rather formless mass of dead leaves, bark shreds, and grass, lined with similar finer material, including rootlets and hair. The 4 white eggs (.67 x .52) are rather evenly speckled with brown.

RANGE: (M.) Breeds from Newfoundland, c. Quebec, c. Ontario, c. Manitoba, and s. Alberta south to Connecticut, n.

Georgia (mts.), s. Ontario, and c. Minnesota. Winters in Ecuador and Peru.

Common Redstart

Setophaga ruticilla—#26

IDENTIFICATION: L. $5\frac{1}{2}$. The pattern is the same in both sexes—black and orange-red in the male, grayish olive-green and pale yellow in the female. Young males are little, if any, brighter than females during their first breeding season. Fall young are like females but more olive to brown above, with less yellow especially in the wings and tail.

HABITS: The redstart, the most animated of our warblers, is rarely still. It has a characteristic habit of drooping its wings, fanning out its tail, and jumping into the air after insects. Deciduous woodlands, open enough to support a good understory of young trees, or open second growth on moist lowlands are common habitats. The bird is so abundant and so widely distributed that few woodlands are without them, especially near openings or swampy spots.

VOICE: The song is thin and not very loud, with a distinctive, high-pitched, sibilant quality. A common form consists of a series of 5 or more short notes, or 2-note phrases, ending in a strongly accented upward or downward slur. There are many variations, and a singing bird often alternates among two or three.

NEST: In an upright crotch of a tree or shrub from 6 to 25 feet aboveground; made of bark shreds and grass, bound with weathered plant fibers and spider webs. The lining is of fine grass, rootlets, and hair. The 4 whitish eggs (.68 x .50) are speckled or blotched with brown.

RANGE: (M.) Breeds from Newfoundland, s. Quebec, c. Manitoba, c.w. Mackenzie, and n. British Columbia south to North Carolina, n. Georgia, s. Alabama, Arkansas, Colorado, n. Utah, and n.e. Oregon. Winters throughout the West Indies and from c. Mexico to Ecuador and the Guianas.

WEAVER FINCHES

Family PLOCEIDAE

English Sparrow

Passer domesticus—#42

IDENTIFICATION: L. $6\frac{1}{3}$. (Remember this length and use it as a yardstick in estimating the size of other small birds.)

The friendly English sparrow is too well known to need description. It molts only once a year, in late summer, and in the new plumage the male's color is partially concealed by gray feather tips. The wearing off of these tips makes its breast brighter in spring. Young are like females but browner above and buffier below, with rather pinkish bills, legs, and feet.

HABITS: The environment produced by the establishment of urban or agricultural civilization in any temperate area exactly suits this bird, which in Europe is known as the house sparrow. Small colonies build up even on isolated farms in the wilderness. Man has transplanted the bird all over the world. Whether or not he acted wisely, the fact remains that today the so-called English sparrow is his constant companion in the temperate zone of every continent.

The birds are always gregarious. Except when nesting, they assemble in large flocks which gather at night into communal roosts in protected spots, e.g., in or on a building, in a tree, or on a vine-covered wall. Summer food is chiefly insects, plus green vegetables, fruits, and seeds. The greater part of the fall and winter diet consists of weed seeds and waste grain.

The history of the introduction of the English sparrow (1850) into North America provides excellent proof of the automatic checks and balances that control wildlife populations. Within less than a century the original few thousands have increased to millions. So long as acceptable habitat remained unoccupied, the extra birds

produced as a result of the sparrow's very high reproductive rate, spread into it. A pyramiding of the total population followed, and a prodigious rate of increase was achieved. Today the available habitat is carrying all the English sparrows it can accommodate, and the same high reproductive rate produces no year-to-year increase in total population. The extra birds become surplus population and are eliminated so unobtrusively by natural mortality factors that we are seldom conscious of the process.

VOICE: Just about all one ever hears is a monotonous *cheep*, a harsh alarm note, and an occasional twittering song which is little more than a series of chirps.

NEST: Varies in form depending upon location. The commonest site is a cavity, usually in a building or bird box, which the bird stuffs with grass, feathers, and trash. When they build in trees, bushes, or vines they construct a bulky domed nest of grass, straw, string, rags, paper, and feathers with a small entrance hole at the side. The 5 or 6 grayish-white eggs (.88 x .60) are evenly speckled with brown, and several broods are raised annually.

RANGE: (R.) Occurs naturally throughout Europe, Asia, and North Africa and has been introduced by man all over the world. In North America has spread over all but the Far North and s. Mexico.

European Tree Sparrow*

Passer montanus—#42

IDENTIFICATION: L. 6. Adults and young are about the same. The best field marks are the rich chestnut top of the head, the black ear spot on the gray cheek, and the small black throat patch.

HABITS: These very gregarious birds are found in farming country near St. Louis and in the city parks. They show no great attachment for dwellings and are scattered over the countryside. The niche which they occupy in Europe is in this country apparently already occupied by indige-

nous species well equipped to hold their own against newcomers. As a result it has made little progress since its introduction into St. Louis in 1870.

VOICE: The commonest call is a *chip*, shorter and higher-pitched than an English sparrow's. It also has a shrill *chur* call and a twittering song.

NEST: In a tree cavity, a hole in a wall, or in a bird box. Very seldom does it build a domed nest like the English sparrow's. The 5 slightly buffy eggs (.76 x .55) are thickly spotted with brown.

RANGE: (R.) Native to Europe and much of Asia. Established in Missouri and e. Illinois in the vicinity of St. Louis.

BLACKBIRDS

Family ICTERIDAE

Bobolink

Dolichonyx oryzivorus—#34

IDENTIFICATION: L. 7¼. A June male bobolink needs no description, but in late winter when this nuptial plumage is new the black feathers are almost obscured by long buffy feather tips. The tips begin to wear off in spring migration, and by the time the bird has reached Florida in mid-April they are almost gone. The white back and the buffy head patches are much darker at first, but as the season progresses they bleach into the shades with which we are familiar. After breeding the males molt into plumage like that of females and young. This is like the female's spring plumage except that the back is darker olive-green and the head and under parts distinctly buffy.

HABITS: Breeding territory is always in an extensive field of tall grass or grain or similar crop. The bird is thus a direct beneficiary of man, since such areas have largely supplanted the original forests of eastern North America. Early cutting of hay and grain (i.e., before July 15) is its

worst hazard, and its abundance is largely dependent upon local mowing dates. In spring and summer bobolinks are highly insectivorous, but in fall they turn to weed and grass seeds, and large migratory flocks can be quite destructive to unharvested grain.

VOICE: The bobolink's famous song, given on the wing or from a perch, is a loud, bubbling series of irregularly arranged higher and lower notes with a metallic quality. As the song progresses the pitch goes higher and higher and the notes tumble out faster and faster. It also has several call and alarm notes, and in migration the birds of a flock call back and forth with a sharp metallic *pink* which identifies them even when they are high overhead.

NEST: On the ground in a heavy stand of tall grass, clover, alfalfa, or similar vegetation; a flimsy cup of grass, plant stems, and rootlets placed in a slight depression. The 5 to 7 eggs (.85 x .62) vary in ground color from a bluish-gray to a reddish-brown and are spotted with brown and purples. One brood is raised.

RANGE: (M.) Breeds from Cape Breton Island, s. Ontario, s. Manitoba, c. Alberta, and s.e. British Columbia south to Pennsylvania, Indiana, n. Missouri, Colorado, and n.e. California. Winters in South America south to n. Argentina and Paraguay.

Eastern Meadowlark*

Sturnella magna—#34

IDENTIFICATION: L. 10 $\frac{3}{4}$. Meadowlarks are much the same in all plumages, but females are markedly smaller and paler and have a narrower breastband. In winter both young and adults are browner: the black is masked and the white areas are buffy. The bird can always be identified in flight by the white outer tail feathers which are also visible on the ground, as it constantly jerks open its tail with a nervous flick as it walks along.

HABITS: Open country with sufficient grassy covering for nesting is required. Where this obtains, the birds are generally common. Beetles, grasshoppers, and similar insects are eaten in summer, weed seeds in winter. The bird is low-flying and alternates between vigorous flutterings of its short wings and brief sailing periods with wings stiffly outstretched and carried slightly downward. Meadowlarks like to sing from the top of a tree or similar vantage point.

VOICE: The song usually consists of 3 to 5 clear, high-pitched, whistled notes—*tsee-you, tsee-ear*. Delivery is slow and the notes long. No two are on exactly the same pitch, and they are often slurred together. The bird has a number of loud, distinctive calls of rough quality, some little more than a chatter.

NEST: A partially domed-over and loosely built structure of grass and plant stems placed in a slight hollow in the ground in dense grassy or weedy cover. The normal 5 white eggs (1.10 x .80) are spotted with browns and purples.

RANGE: (P.M.) Breeds from New Brunswick, s. Quebec, and c. Ontario south to Florida, the Gulf Coast, and n. Mexico; west to e. Minnesota, w. Nebraska, n.w. Texas, n.c. Arizona, and Sonora. In winter most birds retire south from the area north of s. New Jersey, the Ohio Valley, and Kansas.

Western Meadowlark*

Sturnella neglecta—#34

IDENTIFICATION: L. $9\frac{1}{2}$. From the prairie country of the Midwest to the Pacific coast this species replaces the eastern meadowlark. It is slightly paler, the yellow of the chin extends up on to the cheeks near the base of the bill, and the black markings on the flanks are spots rather than streaks.

HABITS: Habits and habitat requirements of the two are essentially the same.

VOICE: The song of the western meadowlark which is heard the year round is its best field character: a deep, rich melody of 6 or 7 notes with a clear, bubbling quality. The almost flutelike notes become hurried toward the end. The call note, a sharp, penetrating *chuck* followed by a rolling sound, is strikingly different from the eastern's.

NEST: Nest and eggs are like those of the eastern species.

RANGE: (P.M.) Breeds from s. Manitoba, c. Alberta, and s. British Columbia south to n. Mexico and east to Minnesota, s. Wisconsin, n. Illinois, Oklahoma, and c. Texas. Absent in winter, except for stragglers, from the area north of Nebraska and Utah.

Yellow-headed Blackbird

Xanthocephalus xanthocephalus—#34

IDENTIFICATION: L. 10. Fall males have the yellow of the head and hind neck obscured by dusky feather tips. Fall females become brighter, with chests of deeper yellow, heads of richer buff, and breasts less streaked. The young are at first a uniform tawny-buff, deepest on the head and throat, but slowly acquire distinctive yellow throats and breasts during the late summer. In a flock with other blackbirds the white wing patch is the best field mark.

HABITS: This species nests in the sloughs and marshes of the West, where tall vegetation grows in fairly deep water. Loose colonies, sometimes numbering thousands, are formed with adults spreading out over adjacent uplands to feed. During the rest of the year they travel in flocks, often with other blackbirds. They feed on insects and weed seeds, adding grain when they can get it.

VOICE: The yellow-head's song starts with a few harsh, distinct notes and deteriorates into a jumble of sounds which ends in a long, rasping squeal. Its call is a hoarse, rattling croak.

NEST: A deep basketlike structure woven out of old reed leaves or cattails taken from the water; usually placed one to several feet above water and supported by growing reeds. The 4 grayish or greenish eggs (1.00 x .70) are speckled with brown.

RANGE: (P.M.) Breeds from n.e. Manitoba, s. Mackenzie, and s. British Columbia south to c. Mexico and east to c. Wisconsin, n. Indiana, and w. Texas. Winters south from s. California and s.w. Louisiana.

Red-winged Blackbird

Agelaius phoeniceus—#34

IDENTIFICATION: L. 9½. Adults molt once a year in late summer, and until the brownish feather edges wear off their colors are somewhat dull. Young look like females but are buffier above and slightly pinkish-buff below. Young males develop a mottled orange shoulder patch but remain quite brownish during their first year.

HABITS: Red-wings commonly breed wherever fresh-water marshes occur. Here they nest over or near water, foraging up to a mile away in croplands, hayfields, orchards, or woodlands. The male's red-and-buff epaulets are much more conspicuous at this season, especially when he shows them in courtship display. At other times the birds wander in flocks that often become enormous. They feed on many crop-destroying insects, and a big flock rolling over a field can significantly reduce their numbers. In fall the birds turn to weed seeds and unharvested grain.

VOICE: Song, a gurgling, liquid *conk-kar-ree*, running up the scale and ending in a trill. It also has a long, high-pitched, whistled alarm note and a harsh *cack*-like call which is usually accompanied by much flicking of the tail.

NEST: A loosely woven cup of coarse marsh grasses or cattail leaves lined with finer grass and roots; most often suspended from the stems of growing marsh reeds a foot or

two above water but sometimes higher in a bush or tree or down on a sedge tussock or even on the ground in dense grass or similar cover near water. The 3 to 5 pale bluish eggs (1.00 x .70) are marked with blackish-purple dots, blotches, and zigzag lines.

RANGE: (P.M.) Breeds from Nova Scotia, Quebec, Keewatin, c. Mackenzie, and Alaska south to Florida, and the Gulf Coast to c. Mexico. Winters south from Pennsylvania, the Ohio River Valley, Kansas, Utah, and British Columbia to Costa Rica.

Orchard Oriole

Icterus spurius—#35

IDENTIFICATION: L. $7\frac{1}{4}$. A fully adult breeding male (i.e., in its second breeding season) is unmistakable. In the fall after the annual molt its colors are somewhat obscured by greenish and buffy feather edges. Young are like females but browner above and more uniformly colored except for a buffy rump. In their first breeding season the sexes are similar except for the male's black chin and throat.

HABITS: Rural country with an abundance of scattered trees along roads and streams or in orchards and about houses is the normal habitat. The bird is either not strongly territorial or the defended territory is small, as they often nest so close together as to suggest a loose colony.

The male sings a great deal on the wing, often delivering its song during a short vertical flight from the top of a tree, to which it returns. Insects are almost the only food, but mulberries are relished.

VOICE: Robin-like in quality. The loud, clear, short song is a fairly high-pitched hurried burst of varied notes that ends with a series of like notes terminated by a slurred, falling note. It has a blackbird-like *cluck* and a squeaky, chattering call.

NEST: An open pouch about as deep as wide, generally woven out of fresh green grass stems and suspended in the forked

branch of a tree or shrub 10 to 20 feet from the ground. Fine grasses and plant downs are used as lining. The 4 to 6 eggs (.82 x .57) are spotted and scrawled with browns and purples.

RANGE: (M.) Breeds from Massachusetts, s.e. Ontario, Wisconsin, and North Dakota south to n. Florida, the Gulf Coast, and s. Mexico and west to w. Kansas. Winters from s. Mexico to n. Colombia.

Black-headed Oriole*

Icterus graduacauda—#35

IDENTIFICATION: L. 9. The greenish-yellow back is the outstanding characteristic. Females differ in being smaller and duller and even greener on the back. Immatures lack the black head and are greenish-yellow above, pale yellow beneath.

HABITS: These lemon-yellow birds prefer rather secluded areas with thick woody vegetation. They are generally found in pairs throughout the year. Mesquite thickets, stream- and pondside growths and tangles in forest openings attract them. They are infrequent singers and stay hidden in the foliage. They do most of their feeding in low growths, eating insects and small fruits like hackberries. This oriole is frequently imposed upon by its relative, the red-eyed cowbird.

VOICE: The whistled song is a soft, sweet, and rather melancholy *peut-pou-it*, with each note on a different pitch.

NEST: Usually between 6 and 14 feet aboveground in a dense shrub or tree. The semi-pensile nest is attached at the top and sides to upright terminal branches and is woven of fresh green grasses. The 4 dull white eggs (.97 x .71) are dusted and mottled with brown and scrawled with black lines.

RANGE: (R.) Occurs from s. Texas south through e. Mexico to Chiapas.

Lichtenstein's Oriole**Icterus gularis*—#35

IDENTIFICATION: L. 9. These birds vary regionally from cadmium yellow to deep orange and are uniformly colored. They resemble male hooded orioles, but the orange-yellow shoulders are distinctive. Young are pale yellow below, rather greenish on the back, and have a more restricted throat patch.

HABITS: This appears to be a treetop species of the forest and of scattered groves in the open or along streams.

VOICE: The song is a rapid repetition of 2 or 3 notes lacking the clear tone of most orioles.

NEST: Placed fairly high, the nest is a hanging cylinder sometimes 2 feet long and only 6 inches in diameter, woven of long, tough fibers, and suspended from a drooping branch. The 3 or 4 eggs (1.16 x .75) are laid in a cup of grass and downs.

RANGE: (R.) Occurs from Tamaulipas and occasionally s. Texas south through e. Mexico to Nicaragua.

Hooded Oriole*Icterus cucullatus*—#35

IDENTIFICATION: L. 8. The long curved bill and graduated tail are distinctive. As with many orioles, the bird varies in color in different parts of its range. In some regions the hood, rump, and under parts of the male are fiery orange, in others cadmium yellow. Above the female is a yellowish-olive which becomes gray on the back; it is uniformly dull yellow below. The wings retain the two white bars of the male. Young males are like females except for the black throat.

HABITS: This is a widely distributed and adaptable species, equally at home in thickets of semi-arid country and heavy timber of river bottoms and other moist areas. Shade trees

often attract it, and it is often common about towns. Most of its food appears to be insects, and it does much of its feeding in low growths.

VOICE: Common calls are a high, thin note or a series of longer chattering syllables. The infrequent song is a warbled series of throaty whistles interspersed with chatter notes.

NEST: At heights from 4 to 20 feet. A favorite site is in the cluster of drooping old leaves below the growing head of a yucca, palm, or palmetto, but some nests are woven into the heart of a living bunch of hanging Spanish moss or in a clump of dense foliage out near the end of a limb. The thin-walled structure is woven of long, wiry fibers, usually of a single kind. It is often semi-pendant and lined with downs and feathers. The 4 white eggs (.85 x .61) are blotched and scrawled with brown, purple, and black.

RANGE: (P.M.) Breeds from extreme s. Texas, s. Arizona, and s.w. California south to s.e. Mexico. Not found in the United States in winter.

Baltimore Oriole

Icterus galbula—#35

IDENTIFICATION: L. $7\frac{1}{2}$. The handsome male in Lord Baltimore colors is known to everyone. Females are extremely variable. Some look like a faded male with the black flecked with olive-brown; others are yellowish-olive above with a brighter yellow rump and tail, and yellow below with only a suggestion of orange. Young are like dull females with no black on the throat. Even in the drabbest plumage there is usually enough orange below and in the tail to set the birds apart from orchard orioles. Their distinct wing bars separate them from the shorter, heavier-billed young and female tanagers.

HABITS: This species likes tall shade trees in towns and along country roads, where it often nests in elms. It also occurs on the edges of fairly open mature deciduous woodlands

and along streams. Its food is largely insects but includes some fruits.

VOICE: A rich, mellow whistle, loud, clear, and rather low-pitched. A single or double whistle is used as a call note, and a loud rattle serves as an alarm note. The song is a disjointed composition of whistled 2-note phrases and shorter, softer single notes broken by long pauses. There is not only a wide variation in the pattern of the song but in the tone and quality of the bird's voice. As a rule, each individual has a recognizably different song.

NEST: A woven bag about 6 inches deep, constricted at the top and suspended from small twigs at the outer end of a usually drooping upper branch of a tall tree. It is made of long fibers from old weed stalks and bark supplemented with horsehair, twine, etc. Light-colored materials are favored, and the nest is generally light gray and quite conspicuous. The 4 to 6 grayish eggs (.92 x .61) are blotched and scrawled at the large end with black and brown.

RANGE: (M.) Breeds from Nova Scotia, Ontario, s. Manitoba, and c. Alberta south to n. Georgia, c. Louisiana, and s. Texas; west to c. Montana and e. Colorado. Winters from s. Mexico south to Colombia.

Bullock's Oriole

Icterus bullockii—#35

IDENTIFICATION: L. 8. The head pattern and white wing patch set the brilliant male apart from other orioles. The duller female has no black, but its saffron-yellow cheek, chest, and tail areas usually contrast strongly with the dirty white of the flanks and belly. Young males resemble females but have a black streak running down the throat from the base of the bill.

HABITS: Bullock's is the common oriole of most of the West. It frequents river valleys and agricultural land up into the lower mountains, nesting in a variety of sites from stream-

side shrubbery to the tops of tall trees around buildings. Feeding birds search treetops and fields, taking mostly insects, but they eat large quantities of cherries and other small fruits when they can get them.

VOICE: Alarm note, a loud rattle. Calls a clear, piping whistle and a softer double note. The song is a series of deliberately spaced, clear, whistled single and double notes.

NEST: A deep, loosely woven bag of grass, horsehair, string, etc., expanded at the bottom and heavily lined with feathers, plant down, or wool; suspended by the rim well out on a branch or woven more completely into a group of ascending twigs in a cottonwood, willow, or in a clump of mistletoe. The 5 grayish-white eggs (.94 x .63) are intricately scrawled with an apparently continuous purplish-black line.

RANGE: (M.) Breeds from s. Saskatchewan and s. British Columbia south to n. Mexico and east to e. South Dakota and s. Texas. Winters in Mexico.

Rusty Blackbird

Euphagus carolinus—#32

IDENTIFICATION: L. $9\frac{1}{2}$. The pale yellow-eyed "rustys" get their name from the brown edges of their feathers. These when new give both sexes a reddish-brown appearance, especially around the head and forward part of the body. By spring the edges have worn off and the birds are a solid color—the male black glossed with greenish, the female slaty with only a hint of gloss. Fall young are browner than adults.

HABITS: Generally solitary during the nesting season, but in large flocks, often with other blackbirds and grackles, at other times of the year. They prefer wet woods and swamps thick with trees or alders and full of shallow pools. They feed mostly on the ground and walk and wade very actively, the unseen flock keeping up a constant babble of squeaks, clucks, and whistles. When flushed they fly

as a unit to continue the chorus from the top of a tree. Insects, many of them aquatic, plus weed seeds, grains, and wild fruits, are their chief food.

VOICE: Call, a hoarse *cack* or lower *cuk*. Its unhurried song is a broken series of high, squeaky notes alternating with several rather musical notes run together in a gurgle.

NEST: These early nesters start out with a bulky mass of sticks and grass mixed with moss and lichens; this supports a well-molded cup of dried duff lined with fresh green grass. Nests are up to 10 feet high in dense clumps of conifers or shrubs near or over water. The 4 or 5 pale blue-green eggs (.92 x .80) are blotched with brown.

RANGE: (M) Breeds from n. Quebec, n. Mackenzie, and Alaska south to n. New England, c. Ontario, c. Manitoba, and c. British Columbia. Winters from New Jersey and the Ohio River Valley south to the Gulf Coast and west to c. Texas.

Brewer's Blackbird

Euphagus cyanocephalus—#32

IDENTIFICATION: L. 9½. The male's head and neck are strongly glossed with purple; in good light this distinguishes it from the equally pale-eyed and black-plumaged spring rusty blackbird. In fall males stay almost solid black. The dark brown-eyed females are smaller and lighter than the yellow-eyed female rustys and are more of a gray-brown. They are also quite pale over the eye and on the throat, and the glossy iridescence shows but faintly. Until the fall molt, young are similar to females.

HABITS: Civilization has favored this species. It nests in colonies of from 6 to 30 pairs in hay meadows and in trees and bushes along lakes and streams. The rest of the year the birds wander in flocks, often with other blackbirds, over all sorts of open country and roost at night in groves. They are common about towns and farmyards, fearless in

tracking the plow and feeding under cattle. Their food is insects and all kinds of seeds, including grain.

VOICE: Squeaks, trills, whistles, and cacks (some hoarse, some musical) combine to produce a noisy but pleasant chatter when a flock performs in unison.

NEST: Coarse twigs, stems, and grasses enclose a cup of hardened mudlike material lined with hair, rootlets, and fine grass. Site variable, from the ground to well up in trees, but often fairly uniform within a given colony. The 4 to 6 grayish eggs (1.00 x .75) are blotched with browns, often very heavily.

RANGE: (P.M.) Breeds from c. Manitoba and c. British Columbia south to n. Mexico and east to Wisconsin. Winters from s. British Columbia and Wisconsin south through Mexico to Guatemala. Casual in winter east to South Carolina and Florida.

Boat-tailed Grackle

Cassidix mexicanus—#33

IDENTIFICATION: L. male 16½, female 12½. The big male is some 4 inches longer than the similarly colored common grackle, and its 7-inch tail seems disproportionately large and broad, as does its long, heavy bill. The smaller clove-brown female is totally unlike females of the other species, and young birds are even paler and browner.

HABITS: This bird is seldom found far from tidal marshes and coastal lowlands. In Florida the extensive low-lying, often marshy terrain, many lakes, and sluggish rivers produce an ideal habitat over much of the state. Boat-tails breed in loose colonies and move about in small flocks the rest of the year. They feed on mud flats along the edge of the water and often wade for food. They take shrimps, crabs, snails, fish, and other aquatic animals; they follow the plow for grubs and they eat corn and rice.

These grackles, together with fish crows and black vultures, often prey upon the eggs and newly hatched young

of the great coastal heronries. Such depredations (unless increased by human disturbance which causes the herons and ibis to leave the nests unguarded) must be regarded as nature's way of placing a check upon the heron population.

VOICE: A variety of loud notes, mostly harsh, guttural clucking and chattering sounds interspersed with deep, whistled notes and squeaks.

NEST: Generally low, 2 to 10 feet up in bushes or canelike growths in or adjacent to a marsh; occasionally high in a tree. The bulky nest is made of coarse, non-woody material with a cup of decayed vegetation and mud in the center lined with fine grass. The 3 or 4 pale blue eggs (1.32 x .90) are spotted and scrawled with dark purple.

RANGE: (R.) Occurs on the south Atlantic and Gulf coasts (including all Florida) south to n. Colombia and on the west coast of Mexico from Arizona south.

Common Grackle

Quiscalus quiscula—#33

IDENTIFICATION: L. 12. The long wedge-shaped tail, which the males often "keel" in flight by depressing the central feathers, is the best field mark. The iridescent sheen on the black plumage varies from green or blue to purple. The smaller females are duller, being iridescent only on the fore part of the body. Young are a uniform dull brown with brown instead of yellow eyes.

HABITS: As these grackles feed on open ground, the conversion of vast acreages to cropland and closely grazed pastures has favored them. Ornamental evergreens now grown to tall trees are also helpful, since they offer ideal sites for nesting colonies. The birds invade cities to feed on lawns, nest in parks, and roost at night in huge flocks in shade trees. They are also attracted to wet areas, where they feed along the water's edge or wade out for food. Originally they were probably more or less confined to such areas.

Grackles feed on all kinds of ground-dwelling insects such as beetles, grasshoppers, and weevils, digging out a great many in their larval or "white grub" stage. Acorns, beech-nuts, and wild fruits are eaten, but much of the fall and winter food is drawn from waste grains, especially corn. In late summer flocks can be quite destructive to unharvested crops. Many other foods are taken in small quantities—fish, crayfish, shellfish, snakes, lizards, mice, nestling birds, and eggs.

VOICE: Harsh cacks and a series of ascending squeaky notes with a pronounced metallic quality.

NEST: A bulky but compact mass of small twigs, stalks, and grasses deeply cupped and often cemented with mud and lined with fine grasses. It may be high in a tree or almost on the ground. Dense evergreens are favored, but low bushes, deciduous trees, and cavities in buildings or old trees are used. Most nesting is in colonies of up to 25 or more pairs. Sites near water are preferred, but favorable clumps of tall evergreens in open farming country often harbor colonies. The 5 pale bluish eggs ($1.14 \times .82$) are spotted and scrawled with brown or black.

RANGE: (P.M.) Breeds from Newfoundland, n. Ontario, and s. Mackenzie south to s. Florida and the Gulf Coast to s.e. Texas. Winters from Maryland, the Ohio River Valley, and Kansas south.

Brown-headed Cowbird

Molothrus ater—#32

IDENTIFICATION: L. 8. The coffee-brown head of the male is always distinctive, although in fall it has a faint purplish tinge. Its shorter bill, longer tail, and paler under parts distinguish the female from a similarly colored but chunkier young starling. Juveniles are dark olive-brown above scaled with pale buff, dull white below streaked with brown.

HABITS: Cowbirds are of South American origin. Of the 7 known species, 4 have parasitic breeding habits. But since

the birds they most frequently impose upon continue to be about as abundant as their habitats permit, it is evident that the cowbird does not have an appreciable effect upon their population level.

Originally this species attended the great herds of bison on the prairies of the Midwest and was known as the "buffalo bird." Now they attend cattle and are common about the man-made grasslands that cover much of the once-forested East. During the breeding season each pair usually has a fixed territory within which the female lays its eggs. The rest of the year they travel in flocks, often with other "blackbirds." Their basic food is seeds of grasses, weeds, and grains. Where available the seeds of yellow foxtail grass (*Setaria glauca*) form a high proportion of their vegetable diet. Grasshoppers and leaf hoppers, stirred up by cattle as they feed, form the bulk of their animal food.

VOICE: The song is a squeaky rattle with musical, liquid quality uttered as part of an interesting courtship performance. It also gives a harsh rattle and a squeaky 3-note whistle.

NEST: These cowbirds lay their eggs in the nests of other birds and allow the foster parents to raise their young. The open nests of vireos, warblers, sparrows, and flycatchers, especially of the red-eyed vireo, redstart, yellow warbler, and song sparrow, are most frequently chosen. Four or 5 white eggs (.86 x .65) evenly speckled with brown are laid a day apart, each in a different nest. Robins and catbirds puncture them and throw them out, chats desert the nest, and yellow warblers often cover them with a new nest bottom, but most birds tolerate them. The incubation period is very short, and the young cowbird throws out any remaining unhatched eggs and kills any other nestlings. It grows fast and is ready to leave the nest in ten days.

RANGE: (P.M.) Breeds from Nova Scotia, s. Ontario, s. Manitoba, s.w. Mackenzie, and c. British Columbia south to c. Virginia, c. Tennessee, Louisiana, and s. Mexico. Winters

from Maryland, the Ohio River Valley, Texas, and c. California south to s. Mexico.

Red-eyed Cowbird

Tangavius aeneus—#32

IDENTIFICATION: L. $8\frac{1}{2}$. The erectile ruff across the back of the neck and the slightly rough-looking plumage are the most distinctive characters. The female is similar to the male but duller, only slightly glossed with bluish-green, and has a smaller ruff. Juveniles are sooty-gray, palest below, where they are faintly streaked with olive.

HABITS: The red-eyed cowbird feeds and migrates in flocks with the brown-headed cowbird and various blackbirds. Habitat preferences and habits are similar to those of its more northern relative, but the red-eyed is not as promiscuously parasitic as the brown-headed. The closely related orioles are its chief victims. In South America another cowbird, the screaming, is parasitic only on a cowbird, the bay-winged. The bay-wing in turn, while it incubates its own eggs and feeds its own young, usually steals an already completed nest from some other bird. Thus we see by what stages the interesting parasitic nesting habits of our brown-headed cowbird probably developed.

VOICE: The song is lower-pitched and wheezier than that of the brown-headed cowbird. It is uttered during a courtship performance that usually takes place on the ground.

NEST: The light blue-green eggs (.91 x .71) are usually laid in the nests of orioles. As young orioles are as large as young cowbirds, they are often raised successfully together.

RANGE: (P.M.) Breeds from c.s. Texas and s. Arizona south to Panama. Winters from the Rio Grande Valley south.

TANAGERS

Family THRAUPIDAE

Western Tanager

Piranga ludoviciana—#36

IDENTIFICATION: L. $6\frac{3}{4}$. In fall the male loses most of its distinctive red face but keeps its black back and yellow wing bars. These bars, which females and young also have, set this species apart from other tanagers. The larger female orioles have wing bars but are differentiated by their sharp-pointed bills and larger size. Young males usually have little red the first year but are otherwise almost like older males.

HABITS: This is a bird of the upper canopy in mature but open woodlands. It feeds chiefly on insects, many of which it catches on the wing. It also likes fruit and during migrations sometimes finds ripening cultivated varieties very attractive.

VOICE: The rough song is much like a scarlet tanager's. The bird constantly utters a colorless chattering call of 2 or 3 notes—*pit-ick* or *pit-er-ick*—and a rather plaintive, soft, purring *tu-weep*.

NEST: At outer ends of pine and oak limbs from 10 to 25 feet up; loosely made of coarse stems, small twigs, grasses, and pine needles with a cup lined with hair or rootlets. The 3 or 4 blue-green eggs (.90 x .65) are lightly marked with small gray-green spots.

RANGE: (M.) Breeds from s.w. South Dakota, s.w. Mackenzie, and n.w. British Columbia south to c.w. Texas, s. Arizona, and n. Lower California. Accidental farther east. Winters from c. Mexico to Costa Rica.

Scarlet Tanager

Piranga olivacea—#36

IDENTIFICATION: L. $7\frac{1}{4}$. In the fall molt, the male loses its red plumage and its new black feathers are edged with

green. Its fall body plumage is not unlike the female's, although somewhat brighter—the back a cleaner green, the top of the head yellowish, and the under parts a richer, almost orange, yellow. Males in the middle of this change have an odd patchy appearance as the color plate shows. In fall the female, instead of growing duller, becomes brighter above and more orange-yellow below.

Juveniles just out of the nest are olive-green above and dull white below (yellowish on belly and yellow under tail), streaked with dusky gray. They have two yellowish-olive wing bars. Immatures look like females, but the males have jet-black wing coverts in the fall. They assume the red body plumage (slightly paler and more orange than an old male's) for their first breeding season.

HABITS: The scarlet tanager is common in mature woodlands throughout its range. As it does most of its feeding in tree-tops, it is not often detected unless one is familiar with its distinctive call note and song. Suburbs abundantly planted with large shade trees are frequently inhabited by breeding tanagers. Leaf-eating insects of the treetops are the chief food.

VOICE: The most frequent sound is a soft, low-pitched, buzzy *tip-churr* given by both sexes. The song is robin-like but has a hoarse undertone or burr that distinguishes it.

NEST: A shallow, flat, loose mass of twigs, stems, and grass lined with rootlets, grass, or pine needles; placed from 10 to 50 feet up, well out on a horizontal limb. The 3 or 4 greenish eggs (.94 x .66) are spotted at the large end with brown.

RANGE: (M.) Breeds from Nova Scotia, s. Ontario, s. Manitoba, and s. Saskatchewan south to South Carolina, n. Alabama, n. Arkansas, and s. Kansas. Winters from Colombia to Bolivia and Peru.

Summer Tanager*Piranga rubra*—#36

IDENTIFICATION: L. $7\frac{1}{2}$. The male stays a rosy red all year and could only be confused with a cardinal. Females differ from female scarlet tanagers in having greener wings and much richer (almost yellow-orange) under parts, brightest under the tail. Young males in fall are even more orange than females; both are separated from orioles by the lack of wing bars. In their first spring young males often do not become fully red but show a strange mixture of red and green patches.

HABITS: The open, drier southern woodlands of pine, oak, and hickory are the preferred habitat. Even fairly young second growth is acceptable, and the bird frequently nests in the outskirts of southern towns. Flying insects are important in its diet, and it is expert at catching them on the wing.

VOICE: The common call note is a rapid, chattering *chick-tucky-tuck*. The song, delivered like a scarlet tanager's, is richer and more melodious.

NEST: Out near the end of a limb 10 to 15 feet aboveground; shallow and often loosely built of stalks, bark, leaves, and like materials, the center lined with fine grasses. The 3 or 4 pale bluish or greenish eggs (.96 x .68) are variously marked with brown.

RANGE: (M.) Breeds from Delaware, c. Ohio, s.e. Wisconsin, s.e. Nebraska, c. New Mexico, and s.e. California south to s. Florida, the Gulf Coast, and n. Mexico. Winters from c. Mexico south to Peru and the Guianas.

SPARROWS

Family FRINGILLIDAE

Cardinal

Richmondia cardinalis—#37

IDENTIFICATION: L. $8\frac{1}{4}$. Its crest, big conical bill, and black face set the male apart from any other red bird. The brown female always has some patches of red and a very conspicuous red bill. Young are like females but may be darker (little or no red) and have a darker bill.

HABITS: This bird is at home in any habitat that includes dense thickets and tangles near open areas—field edges, woodland borders, stream banks, open swamps, parks, and residential districts. It is non-migratory, but individual birds wander extensively, and in many sections it is gradually spreading northward.

Wild seeds and fruit are the chief foods, supplemented by a variety of insects. The birds' fondness for sunflower, melon, and squash seeds will bring them to feeding stations, and a steady supply will help establish wanderers as local residents.

VOICE: Rich, powerful, and pleasantly musical. The song, which often starts softly, is a repetition of short, whistled phrases in which some notes are usually run together. After a few phrases on one pitch the bird generally changes to another. A common song is written *wet-year, wet-year, weet-weet-weet-weet-weet*, another *whurty, whurty, whurty, whurty*. Call note is a sharp *clink*.

NEST: Low, generally 6 to 8 feet up in a bushy thicket or vine tangle; a loosely constructed but fairly deep cup of twigs, stems, leaves, and fibers lined with rootlets, grasses, and often hair. The 3 or 4 white or greenish eggs ($1.00 \times .70$) are variably spotted with reddish-brown, one often quite unlike the others. Two broods are raised.

RANGE: (R.) Occurs from n. New Jersey, s. Ontario, n. Illinois, s.e. South Dakota south to Florida and the Gulf Coast and from c. Texas and s. Arizona south to s. Mexico.

Pyrrhuloxia

Pyrrhuloxia sinuata—#37

IDENTIFICATION: L. 8. The short curved, parrot-like, yellow to horn-colored bill and gray back are characteristic. Females and young are buffy below and have little or no red about the face and under parts.

HABITS: Streamside thickets and dense patches of brush are essential. The bird seldom ventures far from good cover, but a whistled imitation of its call may bring it into sight. Much of its feeding is on the ground, where it takes both seeds (like mesquite beans) and insects, but it is not as terrestrial as the cardinal. Outside the breeding season the species is quite gregarious.

VOICE: The song suggests a cardinal's but is not as loud and clear. The call is a series of thin, flat notes.

NEST: Well up in a dense or thorny shrub; made of twigs, grass, and bark. The 3 or 4 white eggs (.90 x .70) are finely speckled with brown.

RANGE: (R.) Occurs from s. Texas and s. Arizona south to c. Mexico.

Rose-breasted Grosbeak *Hedymeles ludovicianus*—#38

IDENTIFICATION: L. 8. The breeding male is unmistakable. In fall males look more like females but retain their black tail and wings and have some pink on the breast. First-year males breed in similar plumage. The sparrow-like female's large size, big pale bill, bold head pattern, and white wing bars are distinctive. Young birds look like females, but buff usually replaces white.

HABITS: During the breeding season many species of birds are evenly distributed throughout a uniform habitat representing a single vegetative type like forest, field, or marsh, but the rose-breasted grosbeak is one (there are many) which is found only where two types of vegetation come together. The number of breeding pairs that can be accommodated depends upon the total length of the zone of contact between the types. A woodland of fairly large trees beside an open area densely grown up with tall shrubs is ideal. In nature such an edge occurs where a stream, pond, or marsh has created an opening in the forest. But we also find these grosbeaks breeding in parks, residential neighborhoods, and farming country where patches of woodland and shrubby areas are so interspersed as to produce the maximum possible amount of edge. The male has the curious habit of singing softly while incubating the eggs. During summer the bird's food is evenly divided among wild seeds and fruits and insects. It feeds in treetops and close to the ground. Its visits to gardens has led to its name of "potato-bug bird." Its deliberate actions are at times almost parrot-like.

VOICE: Robin-like but sweeter and more liquid. The song is a melodious warble of a dozen or 2 dozen notes uttered quite rapidly, usually in a loud whistle but occasionally in quite a soft tone. The distinctive and frequent call note is a sharp, almost metallic *clink*.

NEST: Generally 6 to 15 feet up, in a low tree branch or crotch, usually not far from water; a frail and loosely woven cup of twigs, stems, grass, and rootlets. The 3 to 5 eggs (.90 x .69) are spotted with brownish or purplish.

RANGE: (M.) Breeds from Cape Breton Island, c. Ontario, c. Manitoba, and s.c. Mackenzie south to c. New Jersey, n. Georgia (mts.), c. Ohio, s. Missouri, and c. Kansas. Winters from s. Mexico south to Venezuela and Ecuador.

Blue Grosbeak*Guiraca caerulea*—#38

IDENTIFICATION: L. 7. The deep purplish-blue males look black at a distance or in bad light. They have a much heavier bill than any blackbird and two brown wing bars, the upper wider and paler than the lower. Young males of the smaller indigo bunting frequently have brown on the wing, but they are usually brown elsewhere above and whitish below. In fall the male's blue is somewhat masked by brownish to buffy feather edges. The dull brownish females and young often have a few telltale patches of blue in the body plumage. The species' most distinctive characters in any plumage are its large size, big heavy bill, and pale wing bars.

HABITS: Originally a bird of dense, low streamside shrubbery and weed tangles, the blue grosbeak now occurs in agricultural areas in thick hedgerow vegetation, on woodland borders and ditchbanks, and in roadside plantings, but still displays a marked preference for relatively low moist areas. The male often sits motionless on top of the tallest available bush to sing for a considerable period. The birds feed in open crop fields but disappear into cover at the least disturbance. Large insects—many taken from the ground—seeds, and grains are the normal foods.

VOICE: The call note is an explosive, sharp *spink*. The song, which does not carry far, is a finch-like jumble of sweet notes run together into a warble.

NEST: A loosely made cup of weed and grass stems into which leaves, paper, and often snakeskins are worked; lined with hairlike rootlets and hair. Tall, coarse weed clumps, thick shrubbery, or low trees are the usual nest site, which varies in height from 3 to 12 feet. The 3 to 4 eggs (.84 x .65) are a pale bluish-white.

RANGE: (M.) Breeds from Maryland, s. Illinois, Nebraska, and n. California south to Florida, the Gulf Coast, and n. Mexico. Winters from Mexico to Honduras.

Indigo Bunting

Passerina cyanea—#40

IDENTIFICATION: L. $5\frac{1}{2}$. The male's blue requires sunlight to bring out its full intensity, and a singing bird against the sky can look quite dark. The nondescript female is one of the most uniformly colored of all our sparrow-like birds. In fall much of the male's blue is obscured by brown feather edges above and paler, often almost white, ones below. Old females and immature and molting males are usually a variable mixture of blue and brown. Some males in first breeding plumage are fully blue except for brown wing coverts and should not be confused with the larger, darker, heavier-billed blue grosbeak.

HABITS: This species requires dense ground cover of brushy growths with an occasional tree or telephone wire for a singing perch. It is found about old pastures and abandoned farms, woodland clearings and old burns, and along forest edges adjacent to fields, streams, and lakes. In summer it is chiefly an insect eater; in fall it turns to weed seeds.

VOICE: The call note is a sharp, brittle *tsick*. The song, delivered from a treetop perch, is composed of well-spaced units of 1 to 3 (usually 2) high-pitched, thin, strident notes. Each group is on a different pitch, and the song descends in pitch and becomes weaker toward the end. The bird is a persistent singer throughout the day and sings into late summer.

NEST: A compactly woven cup of grass, stems, bark strips, and dead leaves placed in a crotch, generally only a few feet from the ground in a dense patch of cover formed by low woody growths, coarse weeds, or vines. The 3 or 4 eggs (.75 x .52) are pale blue. Two broods are raised.

RANGE: (M.) Breeds from s. New Brunswick, s.e. Ontario, n.w. Michigan, and c.e. North Dakota south to c. Georgia, s. Louisiana, and c. Texas. Winters from s. Mexico and Cuba to Panama.

Varied Bunting*Passerina versicolor*—#40

IDENTIFICATION: L. 5. Males look almost black at a distance or in poor light. A closer view reveals a dusky-blue bird washed with reddish-purple on under parts and back. After the late-summer molt the male's colors are obscured by brownish feather tips. The plain female lacks the faint streaks one finds on a female indigo and has only a light eye ring.

HABITS: Wherever dense shrubby tangles are present in otherwise open country one may expect this species. The birds like streamside thickets, mesquite chaparral, and brushy pastures. Most of the time they are on the ground or hidden in vegetation, but the song is delivered from a conspicuous perch.

VOICE: A thin, rather crisp but pleasing song typically bunting in form.

NEST: Low, usually only a few feet up in a shrub in a thicket; a cup of grass, bark, and rootlets. The 3 or 4 eggs (.78 x .58) are a plain bluish-white.

RANGE: (R.) Occurs from extreme s. Texas and s.e. California south to s. Mexico.

Painted Bunting*Passerina ciris*—#40

IDENTIFICATION: L. 5¼. In their first spring young males are like females except for a few patches of blue on the head. The full color may not be acquired for several years. Males wear their gaudy dress the year round but are noticeably darker after the fall molt. Females and immatures are our only green sparrow-like birds. Young just out of the nest are dusky gray-brown above, grayer below, and almost white on the belly.

HABITS: Brushy and weedy tangles, hedgerows, woodland borders, and stream banks are the normal habitat. The

bird frequently nests in well-planted areas in southern towns. Until forbidden by Federal law the species was often kept as a cage bird under the name of "nonpareil." In the wild it is hard to see, as it is extremely shy and its habitat affords good protection. Insects and seeds are eaten, the latter apparently predominating. The birds are known to eat cotton worms and boll weevils and they are very fond of the seeds of foxtail grass.

VOICE: The call is a sharp 2- or 3-note chirp. The bird often sings from a tree- or bush-top perch. The song has been described as a loud, clear chant: *pew-eata, pew-eata, I eaty you too*, deliberately spaced and uttered in a sweet, musical voice.

NEST: In the thick foliage of a clump of bushes or low trees, normally about 3 feet aboveground, occasionally higher; a deep thin-walled cup placed in a crotch or fork and compactly woven of grass, weed stems, bark strips, and dead leaves and lined with hair, rootlets, and other fine material. The 3 or 4 white eggs (.76 x .56) are marked with reddish-brown.

RANGE: (M.) Breeds from s.e. North Carolina, n. Mississippi, and s. Kansas south to n. Florida, s. Louisiana, and s.e. New Mexico. Winters from c. Florida and c. Mexico south to Panama.

Dickcissel

Spiza americana—#43

IDENTIFICATION: L. $6\frac{1}{4}$. In most plumages the reddish-brown wing patch is a good field mark, although it is absent in juveniles and often restricted in females. Dickcissels are always grayer than bobolinks and females are paler than English sparrow females, with sharper back streaks, sharp-pointed tail feathers, and a whiter eye stripe which, like the breast, is usually touched with yellow. The black throat patch of fall males is obscured by pale feather tips. Young

birds in fall are like females but usually more definitely streaked below.

HABITS: This is a bird of open country. During the nesting season upward of a dozen or more pairs may form a loose colony. In migration the birds travel in flocks that are sometimes of great size. Most birds have a strong attachment for the place where they first bred, returning, if not to the same nest site, at least to the same general area. Dickcissels seem to lack this attachment and often shift breeding grounds from year to year in a most erratic manner. One year they may be abundant, the next absent. More than a century ago they were common on the Atlantic coast, but they have not bred in numbers in this area for more than 65 years. Food requirements seem easily met, as they eat a variety of insects, weed seeds, and waste grain. Apparently suitable habitats exist in abundance in most agricultural areas.

VOICE: From a conspicuous perch on top of a weed stalk, bush, or telephone wire the refrain *dick, dick, dickcissel* is repeated over and over, the number of *dicks* and *cissels* varying. The bird sings incessantly into late summer. The opening notes are loud and sharp, the end a buzzy hiss that is lost at a distance.

NEST: Usually on or close to the ground in open fields which support dense vegetation. Fields of clover, alfalfa, hay, grain, or weeds are used. Occasionally they nest in open brushland with scattered trees, and the nest may be well up in a bush or tree. It is a bulky cup of plant stalks, grass, and leaves lined with hair, rootlets, and grass. The 3 to 5 eggs (.80 x .60) are pale blue.

RANGE: (M.) Breeds from s.e. Ontario, n.w. Minnesota, n.w. North Dakota, and n.e. Wyoming south to c. Alabama, s. Mississippi, and s. Texas. Formerly bred from Massachusetts to South Carolina. Winters from Guatemala to Colombia and Trinidad.

Evening Grosbeak*Hesperiphona vespertina*—#38

IDENTIFICATION: L. 8. The huge pale bill and short tail are good characters in any plumage. In flight the wings are prominently black and white and the chunky birds fly with an undulating motion. Females and young show little of the yellow that makes the male so distinctive.

HABITS: The summer home is in the boreal zone of fir, spruce, and other conifers. Highly gregarious, the birds are seen together in small groups, even when nesting. In fall and winter they gather in large flocks. Some remain on their breeding grounds throughout the year; others wander erratically. Increasing numbers in recent years have been returning regularly to certain New England feeding stations. The species feeds on buds, fruits, seeds, and (in summer) insects. In winter they are partial to seeds of the box elder or ash-leaved maple. They come readily to feeding stations, where they prefer sunflower seeds, and, like all northern finches, they are strongly attracted by salt or salt-impregnated earth.

It is interesting to speculate upon the possible long-range effect of the extensive artificial feeding of a species like this one. The winter season, when food supplies are at a minimum, is the most critical period of the year for many birds. The annual year-to-year population of such a bird may be largely determined by the number of individuals that can be carried through the winter by the available food. If enough winter bird-feeding stations are established to free the evening grosbeak from dependence on natural foods its population might increase greatly in years to come.

VOICE: The song is a series of short, abruptly terminated musical warbles, the last ending in a shrill whistle. They also make a chattering sound and utter a number of single- or double-note chirping calls in a loud, ringing whistle.

NEST: Loosely woven out of small twigs, the shallow cup heavily lined with fine rootlets. Twenty to 60 feet up, usually in a conifer in a dense leaf cluster near the end of a branch. The 3 or 4 blue-green eggs (.90 x .65) are lightly marked with gray, olive, and dark brown.

RANGE: (E.W.) Breeds from n. Michigan and c. British Columbia south in the mountains to s. Mexico. In winter they occur east to New England, south to Maryland, Kentucky, and Missouri and in lowlands throughout the West.

Purple Finch

Carpodacus purpureus—#41

IDENTIFICATION: L. 6¼. Their small size, conical bills, and reddish wing bars separate the raspberry-headed males from the larger, pinker pine grosbeak. In fall dull feather edges somewhat reduce the intensity of the color. Females and young are best distinguished by the broad white line over the eye and their heavy streaking. Young males breed and sing in plumage like the female's, but they may be more yellowish or olive-yellow, especially on the rump.

HABITS: The original breeding grounds were in the openings in northern forests created by swamps, streams, and ponds, where an occasional conifer towered above its neighbors. Now they breed also about man-made clearings and invade parks and residential areas where evergreens have been planted.

The males have regular singing perches in tall treetops and perform for long periods morning and evening. Their courtship is intense, males often rising in the air in full song and executing an elaborate fluttering dance before the female.

After nesting the birds wander erratically in flocks in which females and young far outnumber adult males. They are often abundant in an area one year and rare the next. Purple finches come readily to feeding stations and like sunflower seeds, hemp, and the various millets.

Their normal foods—buds, seeds, wild fruits, and insects—vary with the season.

VOICE: The song is a rapid, high-pitched warble with a beautiful liquid quality. Generally the notes run together, but the song may be broken into sections. Sometimes individual notes do not vary much in pitch and the song becomes almost a trill; at other times it is in short snatches, broken by long pauses. The metallic call note is short and distinctive.

NEST: Five to 60 feet aboveground, usually in an evergreen, occasionally in a deciduous bush or hedge; a neatly made cup of fine twigs, grasses, and rootlets, often well lined with hair or wool. The 4 to 6 blue eggs (.79 x .56) are spotted about the larger end with brown.

RANGE: (P.M.) Breeds from Newfoundland, s. Quebec, n. Ontario, and n.w. British Columbia south to n. New Jersey, Maryland (mts.), n. Illinois, c. Minnesota, s. Alberta, and on the Pacific coast to Lower California. Winters from Nova Scotia, s. Ontario, s. Minnesota, Nebraska, and s. British Columbia in varying numbers south to Florida, Texas, s. Arizona, and Lower California.

House Finch

Carpodacus mexicanus—#41

IDENTIFICATION: L. 5½. The male's color is generally a brighter and purer red than that of the purple finch but is more restricted in area. The best character is the heavy brown streaking of the lower under parts. In female and young the less streaked gray-brown back and less contrasting head pattern are generally diagnostic.

HABITS: This gregarious species is at home in sunny open country if water is available. Building, agriculture, and irrigation—in fact, almost all the changes wrought by man—seem to suit this bird, since today it is widespread and abundant both in town and country. In the West it occu-

pies a niche similar to the one the English sparrow has usurped in the East. Although generally a resident species, there is some movement in winter, individuals wandering as far east as south Texas. The bird is chiefly vegetarian, depending primarily upon weed seeds, but it is fond of wild and cultivated fruit.

VOICE: A clear, rolling warble of notes which vary greatly in pitch but run together. It is a longer song than a purple finch's and higher-pitched. The call notes are varied, but the most distinctive is a harsh chatter.

NEST: In a wide variety of places, usually the one that provides the best shelter at hand. Bird boxes, tree cavities, crannies in buildings, dense vines, shrubs and cactus clumps, and even old nests of cliff swallows and orioles are used. The nest is well built out of whatever soft and fibrous substances are available. Often an entire nest is made of one type of material. The 4 or 5 pale blue eggs (.73 x .54) are lightly spotted with black.

RANGE: (R.) Occurs from n. Wyoming and s. Washington south to s. Mexico and east to w. Kansas and c. Texas.

Morellet Seedeater

Sporophila torqueola—#44

IDENTIFICATION: L. 4. These tiny finches with their heavy, blunt, curved bills are extremely variable in plumage. The males seem to require at least several years to develop a clear black-and-white pattern, and some may never develop it. Until then the black markings are less extensive and are masked with gray. The bill is the best clue to the identity of the dull brownish female.

HABITS: Throughout northern Middle America this is the commonest of the many little seedeaters. When not nesting the birds are quite gregarious. Brushy or weedy cover appears to be essential, and they are usually hard to see. The borders of pastures or cultivated land and the banks of irrigation ditches are favorite haunts.

VOICE: The call is a *clickty* note. The loud bunting-like song is composed of a monotonous series of high notes followed by several lower notes.

NEST: A few feet up in a small shrub, usually suspended from several small twigs; a compact cup of fine rootlets or grass sometimes lined with hair. The 4 or 5 blue-green eggs (.65 x .48) are evenly spotted with brown.

RANGE: (R.) Occurs from extreme s. Texas south to Costa Rica.

Pine Grosbeak

Pinicola enucleator—#39

IDENTIFICATION: L. 9. This species, the largest of the grosbeaks, is larger than the purple finch or either of the crossbills, the only birds with which it might be confused. Its narrow white wing bars, stout bill, and long tail are distinctive. The male's red plumage is similar in shade to that of the white-winged crossbill. The female is much grayer than females of either crossbill and has brighter but more restricted greenish areas. Young males are like females, with enough red in the green on the head and rump to produce a rusty to orange effect.

HABITS: The summer home is usually along the border of an open area in the coniferous forest. Habitats adjacent to streams or ponds seem preferred, but the birds are also found on the borders of hayfields and pastures. After nesting they are gregarious and travel in search of food in flocks of up to a hundred birds, in which the fully adult rosy red males are much in the minority. Grosbeaks appear to travel only when it becomes necessary to do so in order to find food. Some years they hardly leave the breeding region; in others they go hundreds of miles south.

In summer they take a few insects but they live chiefly on buds and seeds. Beechnuts and the seeds of all the conifers are special favorites. During their southern wan-

derings, apple seeds, ash fruits, and mountain ash berries seem to attract them.

VOICE: The song is a beautiful melody of whistles, warbles, and trills, sometimes loud, sometimes soft and ventriloquial. The call is 2 or 3 loudly whistled mellow musical notes suggesting the call of a greater yellow-leg. In flight they give a low, trilled whistle.

NEST: In a lower branch of a conifer or in a shrub 6 to 30 feet from the ground. The flat nest is made of twigs and moss lined with grass and fine rootlets. The 3 or 4 pale greenish eggs (1.05 x .73) are spotted with purplish-brown.

RANGE: (E.W.) Breeds in the boreal forests of the whole Northern Hemisphere, south in North America to s. Nova Scotia, n. New Hampshire, s.c. Ontario, and Manitoba. In western mountains breeds south to n. New Mexico and c. California. In winter wanders south to Pennsylvania, Indiana, and Nebraska.

Gray-crowned Rosy-finch*

Leucosticte tephrocotis—#41

IDENTIFICATION: L. 6¼. The amount of gray on the head varies. In one race only the back and sides of the crown are gray; in another the cheeks and sometimes even the throat are gray. Females are paler and duller. The brown-capped rosy-finch, which currently is considered a distinct species, lacks the gray altogether. In another species—the black rosy-finch—the brown of the body is so dark as to seem almost black. Both may well be only races of the gray-crowned.

HABITS: These rosy-finches are found up to the tops of our highest mountains. They generally nest above timber line in sheer rock faces and talus slopes above the snow fields, where they do the greater part of their feeding in early summer. They are active birds, foraging widely over alpine meadows and along the edges of snow pools. Seeds

and insects, which they sometimes catch in the air, are standard foods. In winter wandering flocks are found on bare wind-swept areas from high in the mountains to far out on the Great Plains. The large compact flocks restlessly swirl into the air at frequent intervals.

VOICE: The call note is a high-pitched *zee-o* or a short twitter. The song is a long series of chirps that vary in length and intensity, rather like an English sparrow chorus.

NEST: Under boulders or in rock crevices; a substantial cup of moss and grass lined with fine grasses and occasionally with feathers and down. The 4 or 5 eggs (.89 x .61) are pure white.

RANGE: (P.M.) Breeds from c. Yukon and s.w. Alaska south to n.w. Montana and s.c. California. Wanders in winter east to s. Manitoba, w. Iowa, and south to New Mexico.

European Goldfinch*

Carduelis carduelis—#42

IDENTIFICATION: L. 5½. The red-faced adults are unlike any native species. Young birds are gray-brown above and whitish below, variably spotted and streaked with brown. They lack red and black head markings but have the distinctive yellow wing areas, which in this plumage are crossed by two brownish bars.

HABITS: These birds like hedgerows in open farming country and weeds and thickets on abandoned land. In Europe there is a marked migration, although in some parts of its range it seems more nomadic than migratory. In this country they seem very sedentary and are seldom seen far from the areas where they are known to breed. Weed seeds are the chief food, plus insects in spring and summer.

VOICE: Call, a liquid *twit* uttered frequently in flight and as it feeds. The song is a clear, liquid warble.

NEST: Made of grass and fine roots mixed with down and wool and lined with the same material; placed in small

conifers or hedges. The 4 or 5 pale blue eggs (.72 x .50) are lightly speckled with browns.

RANGE: (R.) Occurs all over Europe, North Africa, and part of Asia. Introduced into North America near New York City in 1878 and St. Louis, Missouri, in 1870. Now a well-established resident in southwestern Long Island, New York.

Hoary Redpoll

Acanthis hornemanni—#41

IDENTIFICATION: L. 5. The chief differences between this species and the next are the smaller bill, the predominately white ground color of the body, which gives it a lighter appearance, the unstreaked rump, and usually unstreaked sides. The pink on the under parts of the male never runs up onto the cheek and extends farther down in the center of the breast than on the sides.

HABITS: The breeding grounds extend to the farthest reaches of the Arctic tundra. In places its range overlaps that of its more southern relative. The habits of the two redpolls do not differ significantly, but the hoary seldom comes as far south in winter or appears in such great numbers as the common redpoll. When hoarys do occur it is usually with a flock of the latter.

VOICE: The notes are sharper than those of the next species.

NEST: On the ground in the lee of a rock or sparse vegetation. Where low trees are available it may be several feet up. The nest is a cup of grass, downs, and bark shreds lined with feathers. The 5 or 6 bluish-green eggs (.73 x .53) are dotted and scrawled with brown.

RANGE: (P.M.) Breeds on the tundra bordering the Arctic Ocean south to the tree line in both hemispheres. Wanders south in winter, occasionally getting as far as Connecticut, s. Ontario, Illinois, and Montana.

Common Redpoll*Acanthis flammea*—*41

IDENTIFICATION: L. $5\frac{1}{4}$. The red cap present in all plumages, except the juvenile, is the best mark. Females lack the rosy breast and rump. This redpoll is quite brownish and well streaked compared with the hoary redpoll.

HABITS: The bird inhabits forest openings, scrub and second growths, swamps of tamarack, willow, and alder, and stream banks throughout the northern part of the spruce forest and ranges well out into the barren lands wherever dwarf willow and birch maintain a foothold. Varying numbers wander south in winter in compact flocks. In summer they feed chiefly on insects, but in winter seeds, especially alder and birch, are their staple food. They are active birds, clinging and hanging in every possible position as they alternately open seed heads and fly to the ground to pick the seeds off the snow.

VOICE: The flight call is a series of rattling, metallic chirps. A feeding flock keeps up a continual twitter. The song is a rippling trill preceded by a twitter not unlike the flight song. It is delivered from a treetop perch or during a display flight as the bird loops and circles with hesitant wingbeats.

NEST: At almost any height but generally low in the forked branches of a willow or birch. Occasionally on the ground in a sedge tussock. Loose colonies are usually formed in favorable sites. The nest has a foundation of twigs, mixed with grass, moss, and other soft material. The cup is lined with downs, fur, and feathers. The 5 or 6 blue-green eggs (.65 x .53) are spotted with reddish-brown.

RANGE: (P.M.) Breeds in the Northern Hemisphere from the tundra south; in North America to s. Newfoundland, n.c. Quebec, n. Manitoba, and n. British Columbia; in Europe to the Alps and Carpathians. In winter irregularly south

to North Carolina, n. Oklahoma, Colorado, and n. California.

Pine Siskin*

Spinus pinus—#42

IDENTIFICATION: L. 5. The uniformly streaked appearance above and below, the rather narrow pointed bill, wing bars, and concealed yellow patches in wings and tail are distinctive. Young are like adults but more yellowish all over and the streaks a richer brown. It can be identified dozens of times by its call note for every time it is seen well enough to distinguish any of the above characters.

HABITS: Conifers are essential to any acceptable breeding ground, and siskins have followed their planting into new areas. Throughout northern or high-altitude evergreen forests they are well distributed but in any given locality much more common some years than others. Like so many birds of the boreal forest, they are erratic both as breeders and as winter visitors to the south. They travel in flocks that may number hundreds and include goldfinches, redpolls, and crossbills. Flocks of apparently non-breeding birds are found all summer. The siskins' summer foods are insects, buds, tender leaves, and seeds. In winter they depend on the seeds of conifers, annual weeds, and especially on those of alder, birch, and white cedar.

VOICE: Song and calls are goldfinch-like but lower in pitch, with a buzzy, husky quality. It has a distinctive penetrating ze-e-e-e-e-m note rising in pitch and intensity at the end.

NEST: A platform of twigs with grass, bark, and moss worked into the mass; the shallow inner cup is lined with down, fur, and feathers. The nest is always in a conifer about 10 to 20 feet aboveground and saddled well out near the end of a branch, where it is protected by foliage. The 3 or 4 pale blue-green eggs (.67 x .48) are dotted with brown and black.

RANGE: (P.M.) Breeds from c. Quebec, s. Mackenzie, and c. Alaska south to Nova Scotia, North Carolina (mts.), n. Michigan, s.e. Nebraska, and s. Mexico (mts.). In winter south to s. Florida, the Gulf Coast, and Mexico.

Common Goldfinch

Spinus tristis—#42

IDENTIFICATION: L. 5. The extremely undulatory flight is distinctive but not diagnostic, as many finches have a similar flight. The uniformly unstreaked olive-brown plumage and the pale bills of females and young are unlike any other finch. Winter males resemble females except that they keep their jet-black wings and bright yellow shoulder patches.

HABITS: During the summer the "wild canary" likes open country with weedy fields and scattered woody growths to provide nest sites. It is one of the latest nesters and is found in flocks until well into midsummer. Winter flocks are often quite large and may include some of the more northern finches. The basic food is weed seeds, which in partially digested form are fed by regurgitation to the young. The birds eat some insects, especially in spring, also buds and succulent vegetation. Birch, alder, and conifer seeds supply them with considerable winter food, and they are more often in woodlands at this season.

VOICE: The songs and calls have a distinctive high-pitched, sweet, twittery quality. On the wing it utters a call like *per-chic'-o-ree*. It also has a *zwe-zeeeee* call. The song is an endless series of trills and twitters, interspersed with *wee* or *swee* notes with an upward inflection.

NEST: An open cup of grass, bark, and plant stems well lined with down, placed in an upright fork in a bush or small tree from a few feet to 20 or more aboveground. The 5 unspotted eggs (.65 x .48) are a very pale blue.

RANGE: (P.M.) Breeds from Newfoundland, s. Quebec, s. Manitoba, and s. British Columbia south to n. Georgia, c.

Arkansas, s. Colorado, c. Nevada, and n. Lower California. Winters south to the Gulf Coast and s. Mexico.

Dark-backed Goldfinch

Spinus psaltria—#42

IDENTIFICATION: L. 4. In different parts of their range the back color of the males varies from olive-green to solid black and the under parts from pale to bright yellow. The heads, however, are always black. Females and young are much like those of the common goldfinch but are olive-green instead of olive-brown above and olive-yellow instead of yellowish-gray below. In flight this species shows a conspicuous and distinctive white patch on the wing.

HABITS: These are abundant throughout all types of reasonably open country, whether humid or dry. Although they usually nest in trees, especially along watercourses, they occasionally nest out in the sagebrush. This species seems very fond of thistle seeds. These and other weed seeds compose its diet. The birds seldom feed in treetops even in winter, when they roam in large flocks in which mated pairs seem to stay together.

VOICE: Sweet and plaintive. The flight call is a brittle, rattling note. The bird also has a single or double *tee* or *tee-yee* call. The twittery, exuberant song often includes notes suggestive of other birds.

NEST: A deep cup rather loosely made of grasses, plant fibers, and downs, placed variously from moderate heights in trees to low bushes or weed tangles close to the ground. The 4 or 5 pale blue-green eggs (.61 x .45) are unmarked.

RANGE: (P.M.) Breeds from n. Colorado and Oregon east to c. Texas and south through Central America to Venezuela and c. Peru. Winters from Texas, New Mexico and n. California south.

Red Crossbill

Loxia curvirostra—#39

IDENTIFICATION: L. 6. Except for very young birds, the long narrow bill with its crossed tips at once distinguishes a crossbill. The brick red of the adult male is unlike the color of any other northern finch. Females are more extensively greenish than pine grosbeaks, and the rump color, which is quite yellow, is much brighter than the head. The less streaked appearance and the plain wings separate females of this species from the next. Juvenile birds are more streaked, and immature males are a mottled mixture of bright yellows, dull reds, and green.

HABITS: This bird is always associated with conifers; its normal home is in the boreal forests of northern latitudes and mountaintops. Its food is conifer seeds extracted from the cones with a bill which has become peculiarly adapted for this one purpose. For some reason, possibly the periodic failure of the cone crop, the birds are erratic in time and place of nesting and in seasonal movements. They nest from January to August, and in certain winters roving flocks occur far outside their normal habitat. Occasionally they nest in extensive pitch-pine areas far south of their normal breeding grounds. Red crossbills eat some insects and, away from conifers, a wide variety of seeds, buds, and wild fruits, which they hunt in treetops and on the ground. As they feed they clamber about in trees, using bills and feet like a parrot. They are quite fearless.

VOICE: Call note, a sharp chick-like *pip* repeated 2 or 3 times. It also has a high-pitched, thin, twittery trill. One of its songs is a series of short, ascending 2-note phrases forcefully delivered in a warbling voice followed by a trill.

NEST: A foundation of twigs supports a shallow cup of bark fibers, rootlets, and grasses padded and lined with moss and downs. The location may be 5 to 80 feet up, saddled in thick foliage, frequently well out on the branch of a

conifer. The 4 or 5 pale green-blue eggs (.75 x .55) are finely spotted with brown.

RANGE: (E.W.) Breeds over the Northern Hemisphere; in North America from Newfoundland, c. Quebec, n. Mackenzie, and c. Alaska south to Maine, n. Georgia (mts.), Michigan, and through the mountains of Mexico to Guatemala. In winter wanders south to n. Florida and the Gulf Coast.

White-winged Crossbill

Loxia leucoptera—#39

IDENTIFICATION: L. 6. The male's rosy red is quite different from the brick red of the preceding species, but the conspicuous white wing bars are the best identification mark in any plumage. Females are grayer and more streaked than female red crossbills. Juveniles are gray, thickly streaked with rich brown. Immature males are a patchwork of yellows, greens, and reds.

HABITS: Like the red, this is a bird of conifer forests but is more northern in distribution and seldom wanders as far south. It travels in smaller flocks and does not mix as freely with other species. Seeds from spruce and fir cones provide its staple food in the North. When it comes south it is attracted by Norway spruce and hemlock but not by pitch pine.

Our two crossbills present an interesting problem. They are closely related, similar in habits and the ecological niche they occupy, yet they apparently thrive in the same area without one tending to displace the other. Nor do they appear to hybridize. The matter is all the more remarkable in that three other pairs of boreal species—the three-toed woodpeckers, the redpolls, and the *Cryptoglaux* owls—present an essentially similar problem. In each case, although one ranges farther north and the other farther south, the greater part of the range is occupied by both members of the pair.

VOICE: The song is a vigorous and varied outburst of loud canary-like *sweets*, frequently dying away into a low warble, then swelling again into a loud, musical trilling. Frequently the song continues unbroken for a minute or more, the bird launching itself into the air from its treetop perch to finish it on hovering wings. A common call is a series of plaintive sandpiper-like *peeps*, also a series of dry, unmusical notes.

NEST: Similar to that of the red crossbill, sometimes constructed largely of twigs and usnea lichens. The height is variable, but frequently it is quite low. The nest is generally in the thick foliage of a spruce or similar conifer. The 2 to 4 pale blue-green eggs (.80 x .55) are blotched with browns.

RANGE: (E.W.) Breeds in the boreal forests of the Northern Hemisphere; in North America from the northern limit of trees south to s. Nova Scotia, n. New York, c. Ontario, s. Alberta, and s. British Columbia. In winter wanders irregularly to North Carolina, s. Illinois, Colorado, and n. Oregon.

Olive Sparrow*

Arremonops rufivirgatus—#37

IDENTIFICATION: L. 5¾. This little olive-green sparrow differs from the larger green-tailed towhee in its striped crown and buffy breast. Young are uniformly dull brown above with only the wings and tail showing a trace of green. They are paler below, becoming buffy on the belly, and have pale wing bars.

HABITS: Although frequently abundant this is a hard bird to find, as it stays close to the ground under brushy cover. It sings from a low perch, where it is hidden by leaves. Overgrown abandoned fields are a favorite habitat, but it also frequents field borders, forest clearings, and tangles of rank weeds and tall grasses in low, moist areas.

VOICE: The call is a loud cardinal-like *clink*. The song is a simple repetition of a single note that becomes a trill at the end.

NEST: A large, round, domed structure of twigs, grass, stems, and leaves, placed 2 to 5 feet up in a bush, low tree, or cactus plant. The 4 eggs (.84 x .65) are pure white.

RANGE: (R.) Occurs from s. Texas south through e. Mexico to Oaxaca.

Green-tailed Towhee* *Oberholseria chlorura*—#37

IDENTIFICATION: L. $6\frac{3}{4}$. Only in strong light do the upper parts of this bird look green. Its pure-white throat, in strong contrast with its gray breast, is its most distinctive character. The edge of the wings and the underwing surfaces are bright yellow and the wing and tail feathers fairly bright yellowish olive-green. Young are streaked all over with dusky and are dull olive or brownish-gray above, dingy white below.

HABITS: Areas well grown up with low brush are the normal home. Scattered trees are tolerated, but when the forest encroaches the bird disappears as a breeder. It seems to prefer hilly to flat land and occurs way up in the drier mountains. It feeds on and near the ground, subsisting chiefly on weed seeds and insects.

VOICE: The common call is a soft, plaintive series of *mews*. The rich, melodious song has been likened to a fox sparrow's but is more varied. A common form begins with a *wee churr*, followed by some high notes or a rough burr and ending with a feeble trill.

NEST: In dense foliage of a shrub near or almost on the ground; a bulky structure of twigs, grasses, and stems with a fairly deep cup lined with rootlets and hairs. The 3 or 4 eggs (.82 x .61) are pale blue to white, evenly spotted with reddish-brown.

RANGE: (M.) Breeds from s.c. Montana and c. Oregon south to c.w. Texas and s. California. Winters from w. Texas and s. California south to c. Mexico.

Eastern Towhee

Pipilo erythrophthalmus—#37

IDENTIFICATION: L. 8. Their large size and the extensive white areas at the corners of their long, rounded tails help identify these birds as they flit through the underbrush and disappear. Juveniles are rich brown above and buffy below, streaked all over with darker brown. Their tail is like the adult female's. Northern birds have red eyes, but in a southern race the eyes are white.

HABITS: Dense brushy cover is essential. Suitable conditions soon develop on poorly kept pastureland or abandoned fields as shrubs and young trees crowd out the grass. Towhees generally persist in a locality until the forest canopy eliminates the last brushy opening. Parks, roadsides, field borders, and even isolated forest openings are occupied by this abundant species if the desired cover is present. The species is fairly solitary. It feeds almost entirely on the ground, vigorously scratching away the dead leaves to get at the heavy insect population of the moist humus layer. It eats insects and other small animal life and seeds and fruits.

VOICE: Call, a 2-note *to-wheee* or *jor-bee*. Its song is very distinctive—2 clear notes generally on different pitches, the first higher, followed by a uniformly medium-pitched trill, often given as *drink your teeeeeeee*. The quality is variable, but the effect is usually musical.

NEST: On the ground in the shelter of a small shrub, clump of grass, stump, or brush pile or up to 5 feet above the ground in a bush or small tree. Two broods are raised, the first often in a ground nest, the second in one above the ground. The loosely built nest is made of coarse stems, leaves, and bark lined with fine grasses, rootlets, and hair. The 4 to 6

white eggs (.90 x .70) are finely dotted with reddish-brown.

RANGE: (P.M.) Breeds from s. Maine, s. Ontario, s. Manitoba, and s.e. Saskatchewan south to Florida, s. Mississippi, n. Louisiana, and Oklahoma. Winters from Maryland, Ohio, s. Wisconsin, and s.e. Nebraska south to Florida, the Gulf Coast, and c. Texas.

Spotted Towhee

Pipilo maculatus—#37

IDENTIFICATION: L. $7\frac{1}{2}$. The chief character which distinguishes this slightly smaller towhee from its eastern relative is the white spotting on the wings and back which is present to some degree in all plumages. The amount of spotting varies in different races, as does the white in the tail. Generally the tail is whiter than in the eastern bird.

HABITS: Dense shrubby cover is common in the low rainfall areas of the West, but this towhee seldom occupies it unless the ground is well carpeted with dead leaves and leaf mold in which it can forage. The bird seldom ventures far from the ground except to sing from a convenient bush top. In the eastern part of its range there is some north and south migration (as well as an eastward movement), but farther west in more mountainous areas this becomes chiefly an altitudinal shift—up in summer and down in winter.

VOICE: The different local races into which this wide-ranging species is divided have noticeably different calls and songs. Common calls are a double mewling note and a single, more nasal one. The song generally starts with one or more clear, high-pitched notes, then runs off into a lower-pitched, buzzy trill.

NEST: Approximately like that of the eastern towhee. The 4 or 5 eggs (.90 x .68) of the palest shade of blue-green are fairly uniformly speckled with few to many red-brown dots.

RANGE: (P.M.) Breeds from s. Alberta and c. British Columbia east to w. Nebraska and w. Texas and south to Guatemala. Winters from e. Nebraska, Utah, and s. British Columbia south.

Lark Bunting

Calamospiza melanocorys—#40

IDENTIFICATION: L. 7. In fall males lose their distinctive plumage and look much like females and young. The young are slightly buffier than the female, and in their first breeding season the male's inner wing and center tail feathers remain brown. The white shoulder patch, conspicuous in flight, is present to some extent in all plumages, although it may be tinged with buffy. It is the best field mark.

HABITS: Grasslands of the drier, more barren type seem to be preferred. Occasionally the species breeds in the moister tall-grass prairies and cultivated clover fields east of its normal range, suddenly appearing in considerable numbers and as suddenly vanishing after one or more years. The birds are usually seen in compact flocks when not nesting. Sometimes the flocks are enormous, yet the birds move in unison as they wheel, turn, or settle to the ground. They eat insects and weed seeds and show special fondness for grasshoppers.

VOICE: The male sings from a prominent perch or more often from the air as it hovers on fluttering wings. The song is a series of trills warbled in a rich, musical voice. On the wing the birds have a distinctive soft, sweet *hoo-ee* call note.

NEST: On the ground, usually in a slight depression under the shelter of a clump of vegetation; a loosely built cup of grass, stems, and rootlets, often lined with hair. The 4 or 5 pale blue eggs (.85 x .65) are generally unmarked. The bird is somewhat gregarious even in the breeding season, and nesting pairs tend to form loose colonies in especially favorable cover.

RANGE: (M.) Breeds from s.w. Manitoba to s. British Columbia south to n.w. Texas and s.e. New Mexico, and from w. Minnesota and e. Nebraska west to w. Colorado. Winters from s. Texas, s. Arizona, and s. Lower California south to c. Mexico.

Ipswich Sparrow*

Passerculus princeps—#47

IDENTIFICATION: L. $6\frac{1}{4}$. This looks like a big and very pale Savannah sparrow with a proportionately longer tail. The yellowish line over the eye is pale and prominent in spring but in winter is almost white. The legs are a pale pinkish straw color.

HABITS: This, the only land bird of Sable Island, a narrow 20-mile strip of sand dunes 100 miles off Nova Scotia, is an insular form of the Savannah sparrow. Whether it should be regarded as a full species is questionable.

Some individuals winter on Sable Island; others scatter down the Atlantic coast along the outer beaches and sand dunes. Its name came from the Ipswich dunes of Massachusetts. A favorite feeding ground is along the wrack line on the upper beach. Here they can be more readily observed than in the beach grass of the dunes. They usually walk or run, seldom hopping like a Savannah. They take insects when available, turning to beach-grass seeds only in winter.

These sparrows are the descendants of what could hardly have been more than a few pairs of Savannah sparrows that originally colonized Sable Island. No such small sample is likely to be typical and carry with it all the genetic factors which produce individual variability within a species. As this small, isolated group interbred it probably lost most of the variant genes it did bring with it and in time became almost completely homogeneous. However, a small population such as this favors the rapid dissemination among its members of such spontaneous var-

iations or mutations as may occur from time to time. If, as it seems reasonable to assume, the habitat available to the birds on Sable Island differs in certain respects from the typical mainland habitat of the Savannah sparrow, certain mutations of no survival value on the mainland might here be sufficiently favorable for them to persist and become diffused through the entire population on the island.

Whether the sum total of these factors has yet produced a bird that would not interbreed with mainland Savannahs, no one knows. It is merely assumed on the basis of the differences which we observe between them that they would not. Should Sable Island eventually wash completely away, as seems likely, forcing the Ipswich sparrow to breed on the mainland or perish, it will survive as a distinct form only if it has actually achieved reproductive isolation from the Savannah. Should this be lacking (in which case it is not a species), interbreeding with mainland Savannahs would soon obliterate the distinctive Ipswich characteristics. Many biologists now believe that new species develop almost exclusively under conditions such as these, where a population is cut off and isolated geographically from the parent species for a period long enough to enable it to develop differences sufficient to prevent any interbreeding when the isolating barrier eventually breaks down.

VOICE: Except when nesting, their only utterance is a sharp, dry *tsip*. The song is slightly lower-pitched and less buzzy than a Savannah's, the second trill ending with a sound like a common tern's *tee-arr*.

NEST: A cup of coarse plant stems and grasses lined with fine grass and hair; placed in a hollow in the ground in the shelter of vegetation. The 4 or 5 eggs (.77 x .65) are either white, bluish, or olive, very heavily splashed with brown.

RANGE: (P.M.) Breeds on Sable Island, Nova Scotia. Winters south to Georgia on the outer beaches of the Atlantic coast.

Savannah Sparrow* *Passerculus sandwichensis*—#47

IDENTIFICATION: L. 5 $\frac{3}{4}$. The Savannah has a short, slightly forked tail which, with the yellow line over the eye and the pale flesh-colored legs, is its best field mark. It has a pair of pale to almost whitish outer tail feathers, but these are not conspicuous. Young lack the yellow eyeline, are less sharply streaked, and, like some winter adults, are often quite buffy on the head and neck, where the color occasionally extends faintly to the breast and flanks.

HABITS: The normal home is low, moist areas dominated by tall rank grasses. The bird is common along streams, rivers, and lakes, and in the dry land edge of fresh- and salt-water marshes. It also breeds in uplands when there is dense herbaceous vegetation or, in some cases, low shrubs. Near the coast it nests and winters in grass-covered sand dunes and hayfields adjoining the tidal marshes.

Savannah sparrows spend most of their time on the ground, where they are very active. When feeding they hop, but to escape danger they run with great speed. No, until they are almost stepped on do they flush, and then only to flutter a short distance before dropping down and disappearing in the grass. Weed and grass seeds and a variety of insects, especially beetles, are its chief foods.

VOICE: The song consists of 2 to 5 generally identical short notes followed by 2 buzzy trills at different pitches, one at least very high-pitched and insectlike—*tsit-tsit-tsit, sweee-zeee*. The Savannah is a persistent singer from the highest available perch, usually a tall weed stem or bush, rarely a tree. Sparrow call notes cannot be adequately described, but they are often distinctive and should be learned in the field.

NEST: On the ground in a slight depression in the shelter of dense vegetation; an open cup of coarse plant stems lined with similar finer material. The 4 or 5 pale blue-green

eggs (.75 x .55) are variably and often very heavily marked with reddish-brown.

RANGE: (P.M.) Breeds from n. Labrador, n. Mackenzie, and n. Alaska south to s. New Jersey, West Virginia, Missouri, n. New Mexico, n.w. Sonora, and s. Lower California. Winters from Cape Cod, s. Indiana, Colorado, and s. Alaska south to Cuba and Guatemala.

Grasshopper Sparrow*

Ammodramus savannarum—#46

IDENTIFICATION: L. $5\frac{1}{8}$. This sparrow is usually recognized by its song, its habitat, and its low, buzzy, wren-like flight. Its small size and disproportionately large head and neck, unstreaked under parts which are pale buffy across the breast and on the flanks, and its short, bristly tail are useful field marks. The dull white ends of the outer tail feathers, the yellow bend of wing, and the yellowish line between eye and bill are hard to see. These markings are absent on young birds, the breasts and flanks of which are first streaked, turning later to a deep buff like that on the upper parts, which are much buffier than those of the adults.

HABITS: This species occurs in drier areas than the Savannah sparrow. Its favorite haunts are old pastures, hayfields, and worn-out farmland sparsely grown up to weeds and grasses. The bird is not uniformly distributed over its known range, and what it regards as acceptable habitat varies greatly. A Florida race inhabits low (1- to 2-foot) palmetto and oak scrub, while far-northern birds are found in clearings and sparsely wooded areas.

Away from the open prairie, where it is uniformly distributed and abundant, breeding groups tend to form loose colonies which shift nesting grounds from year to year. The bird seldom leaves the ground or the shelter of weeds and grasses. When flushed it flutters low over the grass with an

erratic twisting flight and soon drops back to earth. The best time to observe it is when it sings. This it does from the top of a weed, a stone, or a fence post, rarely from a low tree. It is probably our most insectivorous sparrow, being very fond of grasshoppers, weevils, and beetles.

VOICE: The male's song is a long, insectlike buzz preceded by a couple of short preliminary notes. It is pitched so high that many older people cannot hear it. Generally the long buzz is on one pitch but a common variation is a broken jumble of squeaky notes. It often sings at night as well as all day.

NEST: On the ground in a depression near or in a clump of grass or other vegetation. The cup of grasses lined with rootlets and hairs is usually more or less arched over to conceal the eggs. The 4 or 5 white eggs (.72 x .55) are speckled with red-brown about the larger end.

RANGE: (P.M.) Breeds from s. New Hampshire, s. Ontario, s. Wisconsin, North Dakota, and s.e. British Columbia south to Florida, the Greater Antilles, and s. Mexico. Winters from North Carolina, s. Illinois, s. Texas, and c. California south to Costa Rica.

Baird's Sparrow*

Ammodramus bairdii—#46

IDENTIFICATION: L. $5\frac{1}{2}$. The best characters are the short, sharp, black breast streaks that form a narrow band or necklace and the yellow-brown ground color of the head and neck, which is closely flecked with black except for a very broad unmarked crown stripe of rich ocher. The outer webs of the outer feathers of the deeply forked tail are white but not conspicuously so. Young are similar but paler and the markings more diffuse. Its song is its only good character at any distance.

HABITS: Although its breeding range is small, this sparrow is reasonably abundant in migration and on its wintering

grounds. It breeds in the drier parts of open prairies where low brush or old matted vegetation affords good cover. Singing is from the top of a higher than average dead weed stalk.

VOICE: Fuller and less insectlike than that of the grasshopper and Savannah sparrows. The song starts with a series of chips and ends in a rolling, chattering, almost musical trill.

NEST: A cup of coarse stems and grasses lined with similar finer materials; on the ground under a low plant or grass clump. The 3 to 5 white eggs (.80 x .60) are blotched with brown at the larger end and marked with dark lines.

RANGE: (M.) Breeds from c. Manitoba and s.w. Saskatchewan south to n.w. Minnesota and c. Montana. Winters from c. Texas west through n.w. Mexico.

Leconte's Sparrow* *Passerherbulus caudacutus*—#46

IDENTIFICATION: L. 5. The yellow-brown throat and under parts (except belly) streaked on the sides, the red-brown speckled hind neck, and the rich, buffy eyeline are distinctive. Young birds lack the neck markings and are more yellow than brown; the streaks on the under parts extend faintly across the breast to the sides of the throat.

HABITS: During the breeding season look for this diminutive and elusive golden-brown sparrow in the dense, matted vegetation of boggy meadows or on the willow-studded upper margins of marsh areas. At other seasons it may occur almost anywhere in grassland where vegetation of previous years forms a matted cover. One may approach very closely without flushing the birds, as they prefer to escape by running instead of flying. When in song, they rise to the top of a weed or low willow, where they can be studied better than at any other time.

VOICE: High-pitched and thin. The song is a short squeak, followed by a grasshopper-like buzz and a final chip.

NEST: A hair-lined grass cup on the ground or a few inches up in a clump of dead grass; usually well concealed in a tangle of rank, old growth in or near a wet meadow. The 4 white to greenish eggs (.71 x .54) are variously marked with brown chiefly at the large end.

RANGE: (M.) Breeds from s. Mackenzie south to s. Minnesota and North Dakota. Winters from s. North Carolina, s. Tennessee, and s. Kansas south to s. Florida, the Gulf Coast, and Texas.

Henslow's Sparrow* *Passerherbulus henslowii*—#46

IDENTIFICATION: L. 5. The strong greenish tone of the head, hind neck, and face and the dark reddish-brown on the back and wings are distinctive. Unlike the grasshopper sparrow, it has two streaks on the sides of the throat and a necklace of sharp, black streaks across the breast. Most identifications are by song.

HABITS: Open grasslands with varied rank vegetation is the normal habitat. Wet areas are favored, and the birds seem to like a mixture of tall tufted grasses, tall weeds, and scattered small woody growths. Although widely distributed and generally common, their habit of forming loose colonies during the breeding season tends to leave many apparently suitable areas unpopulated. These big-headed, chunky sparrows with their short stubby tails are hard to see unless they are found singing. When flushed the flight is erratic and undulating.

VOICE: The song is a short, explosive, double-noted buzz—flee-sic. It lasts about 2/5 of a second and probably holds the record for shortness. It is delivered from the top of a tall weed or fence post and carries well. Night singing is not uncommon and may continue almost all night.

NEST: A loosely woven cup of grasses on the ground in the shelter of a tuft of grass and often partially domed over. The 4 eggs (.75 x .55) are spotted with reddish-brown.

RANGE: (M.) Breeds from c. New Hampshire, s. Ontario, c. Wisconsin, and South Dakota south to North Carolina, c. Missouri, and n. Texas. Winters from South Carolina, c. Alabama, and s. Arkansas south to c. Florida, and the Gulf Coast to e. Texas.

Sharp-tailed Sparrow* *Ammospiza caudacuta*—#46

IDENTIFICATION: L. $5\frac{3}{4}$. The gray crown stripe, nape, and ear patch, in sharp contrast with the rich buff of the face and the white streaks of the back, are distinctive. Breast and flank color varies from dark to pale buff, and the streaks from sharp to dull and indistinct. Since all birds from a given part of the range have similar variations, five distinct subspecies are recognized. Some of these are occasionally identifiable in the field. Birds of the northern coastal region are pale all over, the buffy areas washed out, the breast streaks broad but blurred. Inland birds have deep, rich buff areas and sparingly and indistinctly streaked breasts.

HABITS: Along the coast this pointed-tailed sparrow lives in the salt-hay meadows of the upper salt marshes. Its habitat joins that of the forked-tailed Savannah sparrow along the wrack line, where marsh and upland meet and the sharp-tailed commonly nests. Inland it chooses a similar location along borders of fresh marshes. The birds seem to colonize favored areas, leaving similar near-by areas unoccupied. They are difficult to see, as they seldom leave the ground except for short song flights. When disturbed they run through the grass like mice. Their food consists of insects, seeds, and small aquatic animals like sand fleas and snails.

VOICE: Call note, a short *chuck*. The song is an insectlike hiss or wheezy trill. It is preceded by 2 short, weak notes and may be divided into 2 parts, the second lower in pitch and weaker.

NEST: Concealed in a grass tussock or on a pile of drift debris just above the high-water line; a loosely woven cup of

grasses. The 4 or 5 pale bluish eggs (.78 x .56) are covered with fine dots.

RANGE: (P.M.) Breeds in coastal salt marshes from Cape Breton Island to Virginia and fresh marshes from s. Mackenzie and w.c. Alberta southeastward to n. Illinois. Winters in coastal marshes from Long Island, New York, to Texas.

Seaside Sparrow*

Ammodramus maritimus—#46

IDENTIFICATION: L. 6. This is a big, dark gray sparrow with a yellow line between the eye and bill, dusky streaked under parts, and a white throat region with a sharp stripe along the jaw.

HABITS: The seaside is exclusively a bird of the salt marsh, preferring the wetter parts along channels, where tall coarse grass grows in soft mud. Semi-aquatic in feeding, it often wades like a shore bird. It is fond of small crabs and other marine animals of the exposed mudbanks. Like other ground-dwelling sparrows, these birds are hard to see. Often the best way to get a look is to squeak on one's hand in imitation of a bird in distress; if you stand still the birds usually work closer or rise to the top of a reed stalk to see what is going on.

VOICE: The call is a squeaky zeep. The song is given from a grass-top perch or as the bird flutters in air. It starts with several short, weak notes followed by a loud, sharply accented buzz, then a lower-pitched trill, becoming weaker toward the end.

NEST: On the ground under shrubs or in patches of drift at the high-tide line; less commonly it is attached to coarse grass stems at a height which keeps it above the tide. It is woven of coarse grasses and lined with finer grasses. The 5 white eggs (.80 x .63) are heavily and coarsely spotted with reddish-brown.

RANGE: (P.M.) Breeds along the coast from s. Massachusetts south to s. Texas. Winters from Virginia (rarely Massachusetts) south.

Merritt Island Sparrow* *Ammospiza nigrescens*—#46

IDENTIFICATION: L. 6. The almost blackish upper parts and the heavy black streaks on the under parts set this species apart from its close relative, the seaside.

HABITS: This bird inhabits fairly dry salt marshes where rushes, salt-hay grass, and glasswort are interspersed with open mud flats. There is some uncertainty as to whether this is a valid species or one in the making; i.e., a race or subspecies of the seaside. In the South the seaside is so sedentary that a few miles of unfavorable habitat can effectively cut off a local population, thus producing the geographical isolation which seems necessary for the evolution of a new species. Whether the Merritt Island sparrow has yet developed mechanisms to insure reproductive isolation from its parent species, should its present geographic isolation break down, is not known.

VOICE: The short song is a buzzy trill preceded by a single liquid note.

NEST: In dense salt-marsh vegetation. Some are almost on the ground, others as high as a foot or so above it. The open cup is made of grasses woven around the supporting stems of the grass or rush clump in which it is concealed. The 4 eggs (.80 x .63) are boldly marked with browns.

RANGE: (R.) The salt marshes of the c.e. Florida coast in the vicinity of Merritt Island.

Cape Sable Sparrow* *Ammospiza mirabilis*—#46

IDENTIFICATION: L. 6. The ashy-green upper parts and white ground color of the under parts distinguish it from the two preceding species.

HABITS: This species, if it is one, lives in small isolated colonies scattered about the wetter parts of a coastal prairie. It is separated from the nearest seaside sparrow population by about 200 miles. As its flat, exposed habitat is swept from time to time by hurricanes and floods as well as by prairie fires, the species must often be reduced to a very few individuals—a factor which would tend to speed up genetic changes. The bird's status as a full species is as doubtful as that of the Merritt Island sparrow.

VOICE: About the same as the Merritt Island bird.

NEST: Like a seaside's. The 5 eggs (.80 x .63) are a pale blue, evenly and heavily marked with browns and grays.

RANGE: (R.) About 3 square miles of brackish coastal prairie at Cape Sable, Florida.

Vesper Sparrow*

Pooecetes gramineus—#47

IDENTIFICATION: L. 6. The white outer tail feathers which give the dark tail its white sides are diagnostic. When perched, the chestnut-brown lesser wing coverts and the line of prominent black spots below them can be seen. The streaks on the under parts do not tend to run together into stripes or a central breast patch as on the song sparrow, but end squarely on the lower breast, where they create a horizontal line of separation from the unstreaked white belly.

HABITS: The vesper is a characteristic bird of high, dry uplands. It likes short-grass hayfields or pastures but is often found along hedgerows and roadsides through croplands. In northern areas it occurs wherever the forest has been opened by lumber operating, burns, windfalls, or clearings. It sings from a low perch or from the top of a small tree, but most of the time it is on the ground, where it feeds on insects and weed seeds. The white outer tail feathers make these the most readily identified of the many sparrows one flushes up along country roads.

VOICE: The song starts with 2 pairs of loud, clear, and fairly long notes, the second pair higher than the first, then becomes a descending series of short, musical trills. It is more deliberate and in general more melodious than the song sparrow's.

NEST: Grass and rootlets are used to build a neat cup on the ground, usually in a slight hollow or by a grass clump, occasionally up in the center of a tussock of grass. The 4 white eggs (.80 x .60) are thickly marked with brown.

RANGE: (P.M.) Breeds from Cape Breton Island, s. Quebec, c. Ontario, s. Saskatchewan, n.e. Alberta, and s. British Columbia south to North Carolina, c. Missouri, Texas, Arizona, and c.e. California. Winters from the southern part of its breeding range south to s. Florida, the Gulf Coast, and s. Mexico.

Lark Sparrow*

Chondestes grammacus—#43

IDENTIFICATION: L. $6\frac{1}{4}$. The white-bordered tail and chestnut head markings make adults unmistakable. Juveniles are heavily streaked above and below but have the chestnut ear patch and the white-bordered tail.

HABITS: The lark sparrow makes itself at home in treeless prairie but seems to reach its greatest abundance in open pastures with scattered bushes and trees. In many regions it is common about farms, country roadsides, and orchards. Occasionally woodland borders, river-bottom groves, and open woodlands are used for breeding. Although it is abundant over a wide area, the number in any given locality may vary in a most erratic and inexplicable manner. The bird is primarily a ground dweller, feeding on weed seeds and insects. The song is delivered from an elevated perch in a low tree or occasionally as the bird hovers in air.

VOICE: The song is rich and melodious, with a wide range in pitch and volume. Two clear introductory notes are fol-

lowed by runs of short notes and trills, frequently interspersed with a buzzing or purring *churr*. The call note is a weak *tsip*.

NEST: On the ground in a depression under a plant that shades it or up to about 10 feet in the fork of a bush or low tree. Rootlets, plant stems, and grasses are used to form a substantial cup. The 4 white eggs (.80 x .60) are scrawled and blotched with black and brown.

RANGE: (P.M.) Breeds from s. Ontario, c. Wisconsin, s. Saskatchewan, and s. British Columbia south to c. Alabama, s. Louisiana, and n. Mexico and east to the Appalachians. Winters from s. Mississippi and n. California south to Guatemala.

Rufous-crowned Sparrow* *Aimophila ruficeps*—#45

IDENTIFICATION: L. $5\frac{1}{2}$. The most distinctive marking is the black streak on the sides of the throat. The bird lacks the strong eyeline of a chipping sparrow. Some races are quite gray above, others more reddish. Immatures have a dull brown, slightly streaked crown and are narrowly streaked with brown across the chest.

HABITS: These sparrows like rocky areas with scattered clumps of brush, small trees, and tufts of grass, preferably near a stream. They often occur in small loose colonies. Few birds stick closer to the ground and are harder to flush. They sing, however, from a perch on top of a low bush. Seeds seem to be their chief food.

VOICE: The call is a sharp double chirp, but when alarmed the bird utters a thin mewing note. The song, after a few introductory mews, becomes a rapid wren-like warble with frequent trilled notes.

NEST: On or near the ground in or under a clump of dense vegetation; a cup of stems, grass, and other fibrous ma-

terial lined with fine grass. The 4 white eggs (.80 x .62) are unmarked.

RANGE: (R.) Breeds from s.e. Colorado, n. New Mexico, and n.c. California south to s. Mexico and east to e.c. Texas.

Pinewoods Sparrow*

Aimophila aestivalis—#45

IDENTIFICATION: L. 6. This bird's most prominent characteristic is its lack of striking markings. It is, however, the buffiest below of all sparrows with unstreaked under parts. Immatures resemble adults but are streaked below with dark gray, especially on the chest.

HABITS: Dry open woods of pine or oak, with a ground cover of grass or scrub palmetto, are the favorite home, but the bird occurs in impoverished pastures and fields dominated by oat grass or broom sedge and scattered with shrubs and small trees. It spends most of its time on the ground and is hard to see or flush. The song, delivered from a bush or the lower limbs of a tree, is heard from February to late August. The bird eats insects and seeds.

VOICE: When disturbed the birds give a snakelike hissing as they run off. The rich, clear song, though not loud, carries well. It starts with a trill, then drops in pitch to a series of distinct, abrupt notes. Its quality suggests the song of a field sparrow.

NEST: On the ground in a clump of grass or palmetto or under a vine tangle or brushy growth; usually arched over and entered from the side. Grass tops are a favorite material, but plant stems of all kinds are used. The 4 white eggs (.74 x .60) are unmarked.

RANGE: (P.M.) Breeds from s. Ohio, c. Illinois, and s.e. Iowa south to s.c. Florida, the Gulf Coast to c. Texas, and east to s.w. Pennsylvania, c. Virginia, and the s. Atlantic coast. Winters from s. North Carolina and s. Alabama south to c. Florida.

Botteri's Sparrow**Aimophila botterii*—#44

IDENTIFICATION: L. $5\frac{3}{4}$. The upper parts are dull brown and the streaking quite indistinct. In flight the tail is darker and browner than the back and wings.

HABITS: Found in areas grown up to tall grass; e.g., the coastal prairies of south Texas. Dense thickets near water attract them, but the birds can live far from water. The one thing they will not tolerate is overgrazing of their grassland; they disappear if it occurs. They are strictly terrestrial, running along the ground like mice and very hard to see.

VOICE: The call note is much like that of a pinewoods sparrow. The song, which is delivered from a perch, never from the air, is a sweet, almost canary-like tinkling quite variable in form. It generally starts with a few halting notes, increases to a trill, and ends with a few slow notes. A pair of notes in the middle clearer and louder than the rest is often a marked characteristic.

NEST: Very little is known about the nest and eggs of this ground-nesting species.

RANGE: (P.M.) Breeds from extreme s. Texas and Sonora south to Guatemala. Retires in winter from the northern part of its breeding range.

Cassin's Sparrow**Aimophila cassinii*—#44

IDENTIFICATION: L. $5\frac{3}{4}$. The pale gray upper parts are sharply marked with sandy-brown and black. The short dusky streaks on the sides of the throat and brown streaks on the flanks are good characters, but they cannot be counted upon, as they are not always present. In flight the tail looks as gray as the wings and back. Young are streaked on the breast.

HABITS: Dry, arid country with sparse short grasses and scattered desert shrubs or cacti is the home of this sparrow. It

tolerates hot, gravelly areas and rocky slopes where only a few plants can survive. It also occurs about openings in dense mesquite or other low vegetation. The song period is long and the bird sings at night as well as all day. The song begins as the bird hovers on fluttering wings and ends as it drops to its perch on top of a bush.

VOICE: The song is a long, melodious trill preceded and followed by one to several soft, plaintive notes, the last of which are lowest in pitch.

NEST: On the ground hidden in the base of a cactus, clump of grass, or low dense shrub; a deep cup of grasses, bark, and plant stems lined with rootlets and hair. The 4 white eggs (.74 x .57) are unmarked.

RANGE: (P.M.) Breeds from s.w. Kansas and s. Nevada south to extreme n. Mexico. Winters from s. Texas and s. Arizona south to c.n. Mexico.

Black-throated Sparrow* *Amphispiza bilineata*—#44

IDENTIFICATION: L. $5\frac{1}{4}$. The head pattern and black throat of adults are distinctive. Young have white throats and breasts streaked with grayish. In any plumage the black tail with white outer edges and tips is a good field character.

HABITS: These birds are most at home in the sparsely vegetated desert uplands and rocky slopes where only scattered cholla cacti and creosote bushes grow. Other plants with which they are frequently associated are dwarf juniper, yucca, agave, catclaw, mesquite, sagebrush, and rabbit brush. They sing from the ground and the tops of the bushes. Foraging is on the ground and in the low vegetation, the birds flying about quite actively.

VOICE: The call is a tinkling *weet* with a rising inflection. The song has a number of variations. One starts with a pair of call notes followed by a short note, then a buzzy trill that

varies in pitch. Another is 3 short ascending and 3 descending notes with a characteristic metallic vibration.

NEST: Low, in the center of dense vegetation, often in a thorny shrub; a loosely constructed cup of bark shreds, grass, and stems lined with soft material like wool, hair, or feathers. The 4 white eggs (.71 x .52) are usually unmarked.

RANGE: (P.M.) Breeds from s.w. Kansas, n.w. California, n. Nevada, and n.e. California south to c. Mexico and east to e.c. Texas. Winters from c. Texas, s. New Mexico, and s.e. California southward.

White-winged Junco*

Junco aikenii—#44

IDENTIFICATION: L. $6\frac{1}{2}$. This is a larger, paler bird than the slate-colored. It has 3 white outer tail feathers and a partially white fourth. The wing feathers are generally but not always margined and tipped with enough white to make them quite light. The wings are crossed by two distinct bars. Females and young are often tinged on the back with brown.

HABITS: These juncos breed in the dry yellow-pine forests of the Black Hills. They favor brushy clearings and recently cutover areas, where they often nest about buildings and even in the tin cans of lumber-camp dumps. In winter they generally associate with other juncos in mixed flocks.

VOICE: Like the slate-colored juncos.

NEST: Under logs, tree roots, or rock ledges, preferably on a hillside above running water. Nest and eggs are like the slate-colored's.

RANGE: (P.M.) Breeds in w. South Dakota, s.e. Montana, n.w. Nebraska, and n.e. Wyoming. Winters from the breeding grounds south to n.w. Texas and n. New Mexico and east to e. Nebraska and e. Kansas.

Slate-colored Junco**Junco hyemalis*—#44

IDENTIFICATION: L. $6\frac{1}{4}$. Males are dark gray and white while females are slightly paler and occasionally brownish on the back and sides. All juvenile juncos are streaked like sparrows above and below. Immatures are brownish above and washed with cinnamon on sides and chest. In all plumages this species has 2 white outer tail feathers and a third partially white.

HABITS: The summer home is in the northern forests of spruce and fir. A few breed south of the conifer zone in deciduous woodlands where only a few hemlocks or white pines occur. Cutover areas with slash piles often attract them. Many nests are along old roads and the edges of clearings. The male's favorite song perch is usually the top of a forest tree or dead snag.

In winter this abundant species scatters over the whole eastern United States. It frequents woodlands and fields but is generally encountered in greatest numbers along hedgerows and brushy field borders. The birds invade residential areas wherever ornamental plantings are available for cover. Flocks are usually small and include other birds, especially sparrows. In winter juncos feed on the ground, taking weed seeds and wild fruit, but during the breeding season their diet includes insects and summer fruit.

VOICE: Call, a series of snapping or clinking notes. Song, a simple trill like a chipping sparrow's but much more musical and occasionally with some variation in tempo or pitch. The bird also has a rambling, broken song, between a warble and a twitter, composed of short, rather faint notes.

NEST: Well hidden on or near the ground among the upturned roots or under the trunk of a fallen tree, under a steep, overhanging bank, or in dense vegetation; a deep nest cup of moss, grasses, and bark shreds lined with fine materials.

The 4 or 5 pale greenish eggs (.76 x .58) are variably spotted with brown. Two broods are usually raised.

RANGE: (P.M.) Breeds from c. Quebec, n. Manitoba, n. Mackenzie, and n.w. Alaska south to Nova Scotia, n. Georgia (mts.), c. Michigan, n. Minnesota, c. Alberta, and s. Yukon. Winters from Nova Scotia, c. New York, c. Michigan, c. Minnesota, Colorado, and w. Washington south to n. Florida, the Gulf Coast, s. Texas, and n.w. Mexico.

Pink-sided Junco

Junco oreganus—#44

IDENTIFICATION: L. $6\frac{1}{4}$. This highly variable species is currently divided into 8 geographical races, some of which look quite different from others. In males the head varies from almost black to slate-gray, the back from rich walnut to pale drab. In the very dark-headed races the hood of the female is much lighter, and in all races it is more or less brown on top and along the nape. The clear pinkish-brown of the sides (occasionally the breast), stopping sharply at the gray hood, combined with the white outer tail feathers, is the unfailing field mark of this species.

HABITS: This junco differs little except in appearance from the slate-colored. In their mountain breeding grounds these juncos show a preference for small openings in the forest. Here the grass and low growths they need for foraging are near the deep shade they seem to find so necessary. Open stands of mature trees that let through enough light to produce the required low growths are also occupied. In winter they are found in flocks wherever bushy growths are near open feeding areas. As slate-colored juncos winter to some extent throughout the range of the pink-sided, both species are often found in the same flock.

VOICE: Apparently the same as the slate-colored.

NEST: Generally on the ground in sites similar to those of the slate-colored; occasionally higher where a solid support is

available on a cliff, cabin beam, or fallen tree trunk. Nest and eggs are like those of the preceding species.

RANGE: (P.M.) Breeds from s.w. Saskatchewan, w.c. Alberta, and s.w. Yukon south to n. Wyoming, s. Idaho, and Lower California. Winters from s. Canada south to n. Mexico and east to e. Nebraska and c. Texas.

Slate-colored x Pink-sided Junco Hybrids

Junco hyemalis x *Junco oreganus*

COMMENT: There is no general agreement as to the number of species of juncos. They form a wide-ranging group which occurs from the Arctic tree line south to western Panama. Although the 21 currently recognized types are assigned to 10 full species, many ornithologists believe that only 2 species are valid, the dark-eyed and the yellow-eyed. The difference in behavior between the birds in these two groups and the close similarity within each group lend weight to their view. Actually, as juncos are all geographically complementary, each with its exclusive territory, they constitute a good example of a superspecies.

Many of the 10 recognized species do not pass the biological test of a valid species. Interbreeding is common where ranges meet, and intergrades or hybrids are frequent. One must expect occasionally to encounter in the field birds showing almost every possible combination of the supposed species characters.

Tree Sparrow*

Spizella arborea—#45

IDENTIFICATION: L. $6\frac{1}{4}$. The single dark spot in the center of the breast, the dark upper and the yellow lower mandibles, and the whiter wing bars distinguish this from the field sparrow. Juveniles are duller brown and streaked with dusky above and below.

HABITS: The summer home is in the stunted trees and shrubs that dominate the region just south of the tundra and along the Arctic coasts. Here the birds are abundant in streamside alders and willows and brushy borders of scattered patches of taller timber. In winter weedy fields adjacent to woodlands and thickets are their favorite haunts. Here they feed on grass and weed seeds which have fallen to the ground or snow, frequently jumping up to pick at the seeds in an unopened head. As early as February they give brief snatches of their beautiful song.

VOICE: Calls a thin *tseet*, in flock a clear double whistle—the whole flock producing a musical twittering. The song is metallic in spite of its sweet canary-like quality. The notes vary greatly in pitch and length. The opening is usually several long high notes followed by a rapid warble.

NEST: On or near the ground in the shelter of low vegetation. The bulky nest is made of plant stems and bark and lined with hair or feathers. The 4 or 5 pale greenish eggs (.75 x .60) are evenly dotted with browns.

RANGE: (M.) Breeds from n. Quebec, n. Mackenzie, and n. Alaska south to Newfoundland, c. Quebec, n. Manitoba, and n. British Columbia. Winters from the Maritime Provinces, Ontario, s. Minnesota, Montana, and s. British Columbia south to South Carolina, c. Arkansas, New Mexico, and n.e. California.

Chipping Sparrow*

Spizella passerina—#45

IDENTIFICATION: L. $5\frac{1}{4}$. The bright chestnut-brown cap, the dark line through the eye, and the white one over it, together with the grayish-white under parts and black bill, are distinctive. Juveniles lack the brown cap but are more generally reddish above and buffy with thick streaking below. Immatures are buffy but unstreaked below, and the cap is buffy, streaked with black.

HABITS: The "chippy" is a bird of open grassy woodlands and openings in denser woodlands, especially where the grass is short and rather sparse and open. Such man-made habitats as orchards, parks, and residential areas with lawns and shade trees fulfill its requirements perfectly. It is a very common dooryard bird. Chippys feed mostly on the ground but always sing from an elevated perch. During summer most of their food is insects, chiefly soft-bodied caterpillars. At other seasons weed seeds are staples.

VOICE: The call is a simple *tsip*. A monotonous series of short, dry notes repeated so rapidly as to be almost a trill is the only song.

NEST: In dense shrubbery, very young evergreens, or vines 3 to 5 feet up, less commonly up to 25 feet on the limb of a tree; a cup of grass and rootlets lined with whatever hair the bird can find. The 4 green-blue eggs (.72 x .51) are speckled about the larger end with brown.

RANGE: (P.M.) Breeds from Cape Breton Island, s. Quebec, n. Ontario, c. Manitoba, Mackenzie, and Yukon south to c. Georgia, s. Mississippi, and Honduras. Winters from North Carolina, c. Texas, and c. California south.

Clay-colored Sparrow*

Spizella pallida—#45

IDENTIFICATION: L. 5½. This pale brown- and gray-backed sparrow lacks the reddish cap of most other clear-breasted sparrows. The light streak through the crown and the dark-bordered brown cheek patch are distinctive. Juveniles are streaked on breast and sides.

HABITS: This sparrow inhabits grassland wherever brush and poplars occur along streams and lakes. To the north it occurs wherever fires or lumbering have opened the forest. It is often abundant where shrubs and young trees have begun to restore forest cover. The males sing from low perches, and most feeding is on the ground or in low vegetation.

VOICE: The call is a weak chip, the song a thin, rasping, cicada-like buzz.

NEST: From ground level to about 6 feet up in a grass clump or more commonly a shrub or small conifer. The bulky nest is of grass and stems lined with hair. The 4 blue-green eggs (.65 x .50) are spotted with black and brown.

RANGE: (M.) Breeds from Minnesota, c. Manitoba, and s. Mackenzie south to n.w. Illinois, n. Nebraska, and w. Montana. Winters from s. Texas and s. New Mexico south to s. Mexico.

Field Sparrow*

Spizella pusilla—#45

IDENTIFICATION: L. 5½. The bright pinkish bill, the buffy wash on breast and flanks, and the blurred character of its markings are the best field characters.

HABITS: Shrubs or low trees with some open area are essential. Poorly kept brushy pastures, abandoned farmland, woodland borders, and cut- or burned-over woodlands fulfill these requirements. The bird is a persistent singer and often sings on moonlight nights. Its singing perch is usually the top of a bush or small tree. In summer adults turn to insects for themselves and their young. At other seasons they feed almost entirely on the seeds of wild plants, foraging on the ground along roadsides, hayfields, and weedy croplands.

VOICE: Call note, a *tsip*. The song is clear, sweet, and melancholy. The first piping, whistled notes are long, the delivery slow. As the song progresses the notes are shorter and come faster, until it becomes a trill. Usually the trill rises or falls in pitch until it fades out.

NEST: Generally near the ground in a clump of grass or a low bush; a well-made cup of grasses and stems lined with hair. The 4 pale greenish eggs (.65 x .50) are spotted and penciled with reddish-brown.

RANGE: (P.M.) Breeds from Nova Scotia, s. Quebec, s. Michigan, s. Minnesota, and s.e. Montana south to South Carolina, s.c. Alabama, c. Louisiana, and c. Texas. Winters from s. New Jersey, s. Ohio, and s. Missouri south to c. Florida, the Gulf Coast, and n.e. Mexico.

Harris's Sparrow*

Zonotrichia querula—#43

IDENTIFICATION: L. $7\frac{1}{2}$. The reddish bill and black face make fully adult individuals of this very large sparrow easy to identify. Young in their first fall have a black crown scaled with buffy, but the throat is white. They have very buffy sides to the head and neck and irregularly blotched upper breasts and sides. Fall birds in their second year have a black throat separated from the black of the breast by a light line.

HABITS: The summer home is in the scattered patches of stunted timber characteristic of the transition zone between the Hudsonian forest and the Arctic tundra. The birds migrate through and winter in the region of the old tall-grass prairie, avoiding the once-forested area to the east and the short-grass plains to the west. In coldest weather they stay in dense river-bottom thickets. Generally they also frequent woodland borders, vine tangles, hedgerows, and brush piles. They are vigorous scratchers and do most of their feeding on the ground, where they find seeds and some insects. Their most notable habit is singing in chorus just before sundown through the fall and winter.

VOICE: Call note, a loud, metallic *spink*. The fall and winter song is 1 or 2 drawling notes whistled in a minor key with an occasional third note on a different key. The spring and summer song is 1 to 5 quavering, plaintive notes on the same pitch, followed after an interval by several clear notes higher or lower in pitch.

NEST: On the ground at the base of a stunted spruce or shrub or in the side of a moss hummock in a wet spot; made of

moss, leaves, and stems lined with grass. The 3 to 5 pale greenish eggs (.94 x .65) are heavily spotted with brown.

RANGE: (M.) Breeds in n. Manitoba and Mackenzie. Occurs in migration from Illinois to c. Montana. Winters from s. Nebraska to s. Texas.

White-crowned Sparrow* *Zonotrichia leucophrys*—#43

IDENTIFICATION: L. 7. The bright reddish-brown bill (yellowish in the race *nuttalli*) and the broad white crown are distinctive. In two western races (*gambelii* and *nuttalli*) the white line on the sides of the head continues over and forward of the eye to the base of the bill. Immatures are buffier all over and have a pair of broad reddish-brown stripes on their buffy heads. This species has the distinctive habit of partially expanding its crown to form a low crest which shows off the white feathers.

HABITS: During the breeding season the white-crowned is found where extensive brushy cover is adjacent to more or less open or grassy areas. Dwarf willow thickets along streams or lakes are favored spots in the North. The birds are also found in wind-swept areas along the seacoast where low shrubs predominate. Singing is usually from a high perch on a bush or tree.

In migration and during winter white-crowns seek similar habitats. Most feeding is on the ground, and they travel in flocks with other sparrows. From Illinois west flocks often contain the typical western *gambelii* race.

VOICE: The call is a *chink* note. The sweet, plaintive song is a short refrain of 5 or 6 notes, the first long and clear, the latter shorter and somewhat husky, falling away in pitch and volume.

NEST: On the ground under a bush or close to the ground in a bush; a bulky cup of twigs, grass, and bark with a heavy lining of finer material, often rootlets and hair. The

4 pale greenish eggs (.86 x .62) are thickly spotted with two shades of brown.

RANGE: (P.M.) Breeds from s. Greenland, n. Quebec, n. Manitoba, n. Mackenzie, and n.w. Alaska south to s. Quebec, c. Manitoba, n. New Mexico, and s. California. Winters from Mississippi, s. Missouri, s. Colorado, and Oregon south to c. Mexico.

White-throated Sparrow* *Zonotrichia albicollis*—#43

IDENTIFICATION: L. 6¾. The white throat and the yellow area between the eye and bill, together with the striped head pattern, are good field marks except for juveniles. Juveniles are strong chestnut-brown above and yellowish-white below, with heavy dusky streaks except on the chin and belly.

HABITS: Wherever an opening in the forest permits the growth of low shrubs and clumps of small trees one finds the white-throat. Cut-over areas with slash piles, brushy pastures, and borders of clearing afford ideal habitats. The birds sing from the ground or a low perch in a bush. Feeding is chiefly on the ground, where they scratch noisily in dead leaves. White-throats and their close relatives eat more wild fruits than most sparrows. Wintering flocks are found wherever there are thickets, brushy field borders, and weed tangles.

VOICE: Call, a lisping sst. The very beautiful but melancholy song starts with 2 or more long, whistled notes which usually vary a little in pitch. Then the bird repeats a short 3-note phrase from 4 to 6 times, the last 1 or 2 becoming weaker. Phonetically it sounds like *Old Sam, Peabody, Peabody, Peabody, Peabody* sung in a thin, high-pitched minor key.

NEST: On the ground sunk into a hollow, often in a moss-covered hummock under overhanging vegetation, occasionally up a foot or two in a dense conifer; a cup of grass,

moss, and rootlets lined with fine grass and hair. The 4 or 5 pale greenish eggs (.82 x .60) are heavily spotted with brown.

RANGE: (M.) Breeds from Newfoundland, c. Quebec, n. Manitoba, and n. Mackenzie south to Nova Scotia, n. New England, n.e. Pennsylvania (mts.), s. Ontario, c. Wisconsin, s. Montana, and c. Alberta. Winters from Massachusetts, s. Pennsylvania, the Ohio Valley, and Missouri south to n. Florida, the Gulf Coast, and n.e. Mexico.

Fox Sparrow*

Passerella iliaca—#47

IDENTIFICATION: L. 7¼. The reddish-brown tail and heavily marked under parts are distinctive. In the West fox sparrows of different areas vary greatly in the relative amounts and tone of gray and brown in their plumage.

HABITS: This large, wary sparrow inhabits dense woodland thickets. On its breeding grounds it is common in stream-side growths of willow and alder, brushy burned-over lands, and meadow borders of shrubs and young conifers. The birds do most of their foraging in the leaf litter on the ground. Using both feet at once, they kick it vigorously aside as they dig holes well into the leaf mold and humus—a layer rich in small animal life. They sing from a perch on top of a bush or small tree and are often heard singing south of their breeding grounds.

VOICE: Call, a drawn-out stssp. The loud, short song is a variable carol of clear, melodious notes, richer than those of any other sparrow. Generally the song rises in pitch, then falls on the closing notes.

NEST: A few feet from the ground in a tangle of low vegetation or on the ground under a bush. The large nest is made of grass, moss, roots, and leaves and is often lined with feathers and fur. The 4 pale greenish eggs (.90 x .69) are thickly spotted with reddish-brown.

RANGE: (P.M.) Breeds from n. Quebec, n. Ontario, n. Manitoba, n. Mackenzie, and n.w. Alaska south to Newfoundland, s. Quebec, s. Manitoba, Colorado, Nevada, and s. California. Winters from Maryland, s. Indiana, s. Missouri, New Mexico, and British Columbia south to c. Florida, the Gulf Coast, c. Texas, and Lower California.

Lincoln's Sparrow*

Melospiza lincolnii—#47

IDENTIFICATION: L. $5\frac{3}{4}$. The buffy wash across the breast and the numerous fine black streaks on the under parts are the best field marks. Unfortunately the buffy wash is sometimes very faint and the spots on the center of the breast occasionally coalesce into a dark spot similar to a song sparrow's. The buffy-olive upper parts, rich brown only on the crown and wings, are uniformly and sharply streaked with black from the crown to the rump. Young are similar to adults but less strongly marked.

HABITS: Lincoln's sparrow breeds along the borders of frequently flooded wet meadows, swamps, woodland bogs, ponds, and streams. Alders, willows, and other shrubs are used as singing perches, but the birds spend most of their time on the ground. In migration they prefer similar wet places but may be found wherever there are dense thickets and weed tangles. At this season they seldom sing, and their skulking habits make them virtually invisible. They are curious, however, and respond to squeaking on the back of one's hand. Although this is a reasonably common species over much of North America, its regular occurrence on a "birder's" year list is evidence of proficiency.

VOICE: Call note, a low *tsup*. The hurried song is a series of trills and liquid, slightly buzzy notes suggesting a house wren's song, but in sweetness and clearness it is more like a purple finch's. The last several notes are often abruptly louder, harsher, and lower in pitch.

NEST: On the ground or in a swamp tussock, generally well hidden under vegetation; a cup of grass and fine sedges. The 4 or 5 pale greenish eggs (.80 x .60) are heavily spotted with browns.

RANGE: (M.) Breeds from Newfoundland, n. Quebec, n. Manitoba, s. Mackenzie, and c. Alaska south to Nova Scotia, n. New York, n. Minnesota, n. New Mexico, and s. California. Winters from n. Mississippi, s. Oklahoma, s. New Mexico, and c. California south to c. Guatemala.

Swamp Sparrow*

Melospiza georgiana—#47

IDENTIFICATION: L. $5\frac{3}{4}$. This is a notably dark sparrow with rich chestnut on wings and back. Fall adults are often quite buffy below, especially on the sides; the clear reddish crown is often streaked with black and divided by a light stripe. Juveniles are marked below like the adult Lincoln's but are darker above and lack the reddish head stripes.

HABITS: Open fresh-water marshes filled with rank vegetation are the typical home. The bird is also found about the borders of ponds and sluggish streams fringed with marsh plants and alder thickets. When not nesting it is less exacting and may be scattered over broom sedge and weed-grown fields, brush patches, and hedgerows along with other sparrows. Like the other wet-land sparrows, these stay on the ground and are hard to observe unless singing. This they do from an elevated perch on a reed or bush top.

VOICE: Call, a metallic *chink*. A common song is a rapidly repeated or trilled series of short, single notes. A richer song is composed of double upslurred phrases—*peet-peet-peet-peet*. Both songs are long, loud, and fairly musical. Sometimes 2 notes, one higher than the other, are trilled simultaneously at different tempos.

NEST: Close to the ground in a dense tussock or mat of marsh vegetation or a few inches up in a bush; a well-hidden cup

of grass, often entered from the side. The 4 or 5 blue-green eggs (.76 x .57) are blotched with brown.

RANGE: (P.M.) Breeds from Newfoundland, s. Quebec, n. Manitoba, c. Mackenzie south to New Jersey, West Virginia, n. Illinois, and n. Nebraska. Winters from about the southern limit of the breeding range south to s. Florida, the Gulf Coast, and c. Mexico.

Song Sparrow*

Melospiza melodia—#47

IDENTIFICATION: L. $6\frac{1}{4}$. The dark spot in the center of the breast is the best field mark. Juveniles are similar to swamp sparrow juveniles but not so rufous on the back and wings. This species is divided into many geographical races, which vary greatly in color. In certain small, lightly marked races all markings are in bright rusty-brown; in other large, heavily marked races they are nearly all in dark sooty-brown. In flight the long rounded tail which is pumped up and down is very characteristic of the species.

HABITS: Wherever there is brushy cover with water not too far away one may expect song sparrows. They commonly occupy cutover lands or abandoned farmland from the time a few shrubs become established until the second growth has formed a closed canopy. They readily accept shrubbery about houses yet are equally at home in wild alder swamps and shrub-fringed woodland lakes. They sing from an elevated perch but do most of their feeding on or near the ground. They give brief snatches of song on sunny days throughout the winter.

Few species have been as intensely studied as this. Mrs. M. M. Nice's reports on the details of its life history are classics in their field. She came to know hundreds as individuals and followed the fortunes of many through an entire life span, which for this species may run more than 7 years.

VOICE: Call note, a loud *tchunk*. The 7- to 11-note song varies greatly in pattern and pitch but usually starts with 3 identical notes. These are usually followed by a trilled note plus a series of short notes differing widely in pitch. The song lasts 2 to 3 seconds—5 to 7 a minute on the average.

NEST: Early nests are usually on the ground, hidden in matted clumps of last year's grass or weed stems. Later nests are more apt to be up to 4 feet in a dense shrub or conifer. The well-built cup is of grass stems and leaves often lined with horsehair. The 4 greenish-white eggs (.80 x .60) are blotched, often heavily, with browns.

RANGE: (P.M.) Breeds from Cape Breton Island, s.c. Quebec, n. Ontario, s. Mackenzie, and s. Alaska south to North Carolina, n. Georgia, Missouri, North Dakota, and c. Mexico. Winters from s. New Brunswick, s. Ontario, s. Wisconsin, Montana, and British Columbia south to s. Florida and the Gulf Coast.

McCown's Longspur *Rhynchophanes mccownii*—#48

IDENTIFICATION: L. 6. The black T on the white tail is a distinctive field mark in all plumages. Females and young are otherwise much like those of the chestnut-collared longspur. In winter males are somewhat tawny above, and their black markings are partly hidden by gray feather tips.

HABITS: Dry, short-grass plains dominated by buffalo grass are the home of this bird. In the moister eastern prairie where grass grows taller they are found only on higher, more barren ridges and benches. Here they may be abundant in dry years and virtually absent in wet years. Their commonest associates are horned larks and chestnut-collared longspurs. After breeding they gather into large flocks for their southward travels. Grasshoppers are generally their staple summer food, seeds of grasses and weeds at other seasons.

VOICE: Call note, a double *chirrup-chirrup*. The loud, clear song is a sweet, twittering warble poured forth as the bird floats slowly and erratically back to the ground after a steep rise. As it falls the tail is spread and the wings are held aloft, showing their white linings.

NEST: In a hollow in open prairie; made of grass and often lined with hair. The 3 or 4 greenish eggs (.81 x .57) are marked and blotched with black and brown.

RANGE: (M.) Breeds from s. Saskatchewan and c. Alberta south to n. North Dakota and n.e. Colorado. Winters from Kansas and Colorado south through Texas and Arizona to n.w. Mexico.

Lapland Longspur

Calcarius lapponicus—#48

IDENTIFICATION: L. $6\frac{1}{4}$. The tail is largely black, only the 2 outer feathers being partly white. Breeding females, though duller, have a pattern not unlike the male's, but the black areas are more restricted and more obscured by light feather tips. In winter both sexes are duller because the pale tips and edges of the fresh feathers hide the underlying black and brown. In these dull plumages the parallel buffy lines on the back are good field marks. The legs are black or dusky.

HABITS: In the southern part of the Arctic barren grounds south to the tree line this is an abundant land bird. It seems to prefer wet hummocky areas overgrown with dwarf birch and crowberry. As winter darkness comes on the birds move south across the northern forests; most of those in North America head for the open prairies and plains of the Midwest. In other regions only small numbers are encountered in association with snow-buntings and horned larks, usually on bare, wind-swept pastures, plowed fields, and coastal dunes. Grass seed is a staple winter food, and the birds frequently alight on a stalk to pick at the seed head.

VOICE: The harsh, rattling flight call has been put down as *dikerick, dikerick, psu'o, psu'o*. The liquid, gurgling, bobo-link-like song is given during a song flight like that of the preceding species.

NEST: On the ground under a tussock of grass or a dwarf shrub; made of grass and moss lined frequently with feathers and hair. The 6 greenish-gray eggs (.83 x .60) are thickly blotched with browns and purples.

RANGE: (M.) Circumpolar in breeding range. Winters in Eastern and Western Hemisphere. In North America breeds from e. Greenland (lat. 75°), the Arctic Islands (lat. 73°), and n.w. Alaska south to the northern limit of trees in n. Quebec, n. Manitoba, n.w. Mackenzie, c. Alaska, and the Aleutian Islands. Winters south to New York, Missouri, Colorado, and n.e. California.

Smith's Longspur

Calcarius pictus—#48

IDENTIFICATION: L. 6½. This species has the 2 outer tail feathers largely white. In winter the male resembles the female but retains the distinctive white-tipped, black lesser wing coverts. The bill is slenderer and more pointed and the entire under parts buffier than in other longspurs. The legs are yellow.

HABITS: This longspur has a much more limited distribution than the Lapland. Both species occur in the same area, with this showing a preference for ridge summits and other dry areas. Though the bird is not generally common, enormous flocks are sometimes encountered in fall and winter on the western grasslands, especially where the grass is very short.

VOICE: In flight a strange series of sharp, clicking notes in rapid succession, not unlike the winding of a cheap watch. The song resembles the flight call and is usually given from the ground.

NEST: Sunk in a hole dug by the birds or placed in a mossy hummock or sedge tussock in open tundra, often near a strip of sheltering trees; made of fine grasses lined with willow catkin down and feathers. The 4 to 6 clay-colored eggs (.80 x .65) are lined and spotted with purplish-brown.

RANGE: (M.) Breeds along the southern edge of the tundra from n. Manitoba west to n. Alaska. Winters from Illinois and Kansas south to c. Texas.

Chestnut-collared Longspur *Calcarius ornatus*—#48

IDENTIFICATION: L. $5\frac{3}{4}$. The predominantly white tail with a small triangular central wedge of black at the end is distinctive. Females and young are like McCown's but faintly streaked on sides and breast where that species is virtually unmarked. Winter males have the black-and-brown markings obscured by pale feather edges.

HABITS: The chestnut-collared longspur is found in dry, grassy uplands. It ranges farther east than McCown's, occurring in prairie areas that receive more rain and normally support a taller and denser stand of grass than the plains. Where the two occur together the chestnut-collared seeks the moister spots with taller grasses for its nest. In general habits they are much alike. Widespread plowing of the prairie has eliminated this longspur from many areas where it was once abundant.

VOICE: Flight call, a musical twitter. The brief, high-pitched, rather weak, twittery song is uttered at intervals while the bird flutters aloft.

NEST: In a hollow which the birds dig in the ground, usually where it is concealed by tall grass or a low shrub; a grass nest often lined with hair. The 4 greenish eggs (.73 x .56) are marked with brown and lavender.

RANGE: (P.M.) Breeds from Manitoba and s.e. Alberta south to w. Minnesota, e. Nebraska, c. Kansas, and e.c. Wyo-

ming. Winters from Iowa and Colorado south to Texas, Arizona, and n. Mexico.

Common Snow-bunting *Plectrophenax nivalis*—#48

IDENTIFICATION: L. 7. The wings, white except at the end, serve as the best field mark. The body plumage of young in their first winter is heavily overlaid with rusty. Winter adults, though extensively rusty, show more white.

HABITS: The treeless tundra that stretches south in all directions from the Arctic Ocean is the summer home. In this land of continuous summer sunlight and teeming insect life, it is sometimes the only land bird and always one of the most abundant about cliffs and slopes. Moths, crane flies, mosquitoes, and other insects are staples at this season. In winter they depend upon the grass and weed seed heads that remain above the snow. When snowfalls bury them the birds are forced farther south. "Snowflakes" are especially attracted to the trash which the wind piles up on lake and stream shores, and the first arrivals are usually found there. On the seacoast they frequent dunes, salt marshes, wind-swept grasslands, and the open beach, where they sometimes follow the waves like sandpipers.

VOICE: In flight, a sweet single or double whistle often followed by a musical trill. The most interesting call is a purring note with a curious trembling quality. The song is a broken twittering warble given from a rock-top perch or as the bird flutters in air.

NEST: In a crevice in a ledge or on the ground, as well hidden among rocks or vegetation as the surroundings permit; made of moss and earth lined first with sedges, then with feathers and fur. The 4 or 5 eggs (.91 x .64) have a wreath of reddish-brown spots.

RANGE: (M.) Breeds in Arctic and sub-Arctic regions all over the world; in North America from n. Greenland (lat.

83°) and n. Alaska south to n. Quebec, n. Mackenzie, and c.w. Alaska. Winters from c. Quebec, c. Manitoba, and s. Alaska south to Pennsylvania, s. Indiana, Kansas, and e. Oregon.

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Audubon Water Bird Guide

WATER, GAME AND LARGE LAND BIRDS

The map reproduced on the back end paper of this book has been designed to provide helpful data for the student of waterfowl and pelagic birds. The major flyways along which the ducks and geese of eastern North America travel on their annual migrations are shown by arrows. The coastal shelf waters into which truly pelagic birds seldom wander are shown as dotted areas. The average surface temperature of the various parts of the North Atlantic is indicated by isothermic lines at 5-degree Centigrade intervals. For convenience in recording bird observations on the high seas, E. M. Nicholson has suggested assigning a name to each 10-degree square area of the Atlantic Ocean, as indicated. Some years ago Poul Jespersen published a map giving the average number of sea birds that he recorded per day in various parts of the Atlantic, and these have been inserted in each square. In order to develop really significant averages for various parts of the Atlantic many more such daily counts should be made and published even if the observer cannot always identify every one of the birds seen.

Audubon Water Bird Guide

WATER, GAME AND LARGE LAND BIRDS

*To all who find joy and recreation in a
better understanding of the many forms of life
with which we share the earth.*

AUDUBON

WATER BIRD GUIDE

WATER, GAME AND LARGE LAND BIRDS

Eastern and Central North America
from Southern Texas to
Central Greenland

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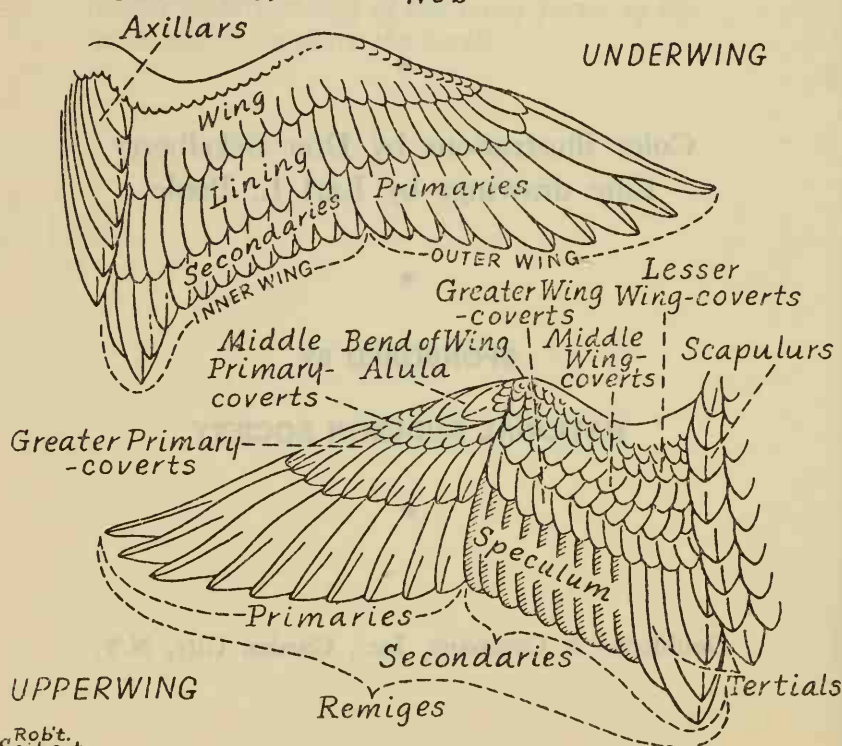
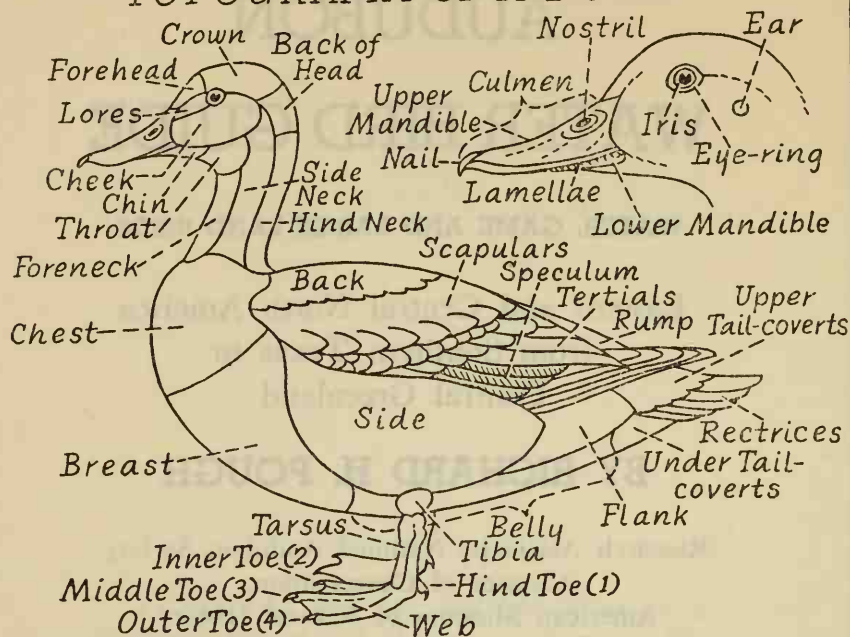
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TOPOGRAPHY OF A DUCK



Rob't.
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Foreword

To get the most out of this book you should know certain things about the region and the birds it covers. These will be covered in the Foreword and not repeated again in the text.

AREA: The area covered (some five million square miles) is eastern North America north of Mexico, excluding East Greenland. The line dividing eastern from western North America is taken as the eastern edge of the semi-arid Great Plains, where the tall-grass prairie country meets the drier, short-grass plains. In the United States it corresponds approximately with the one hundredth meridian running north through central Texas, western Oklahoma and Kansas, central Nebraska, and the Dakotas. In the Prairie Provinces of Canada, where the Great Plains end at the edge of the Hudsonian Forest, it swings sharply west and closely parallels the eastern side of the Rocky Mountain system almost to Alaska. The line roughly marks the westward range limit of many of the most typical birds of the humid East, but is far enough east to exclude most of the distinctly western birds, except for species that roam far out across the grass-covered lowlands in winter.

SCOPE: All birds are classified in a systematic series. The position of any bird in the general scheme is determined by its degree of specialization. Fossil remains show that birds were originally less highly specialized than they are now. Some water birds are still relatively simple, but most land birds are exceedingly complex. The standard classification begins with the more primitive birds like loons and grebes and ends with the most highly specialized—the sparrows.

The first and broadest of the groupings are called orders. Within the orders, closer relationship is expressed by the term family. Families are divided into genera and genera into species. The species describes the individual bird. It is a natural biological unit. It reproduces its own kind and, no matter how much two birds may look alike, they are not of the same species if they live in the same area and do not interbreed. This book follows the sequence of orders, families, genera, and species established by the American Ornithologists Union in their check-list.

The birds (estimated as between twelve and fifteen billion) that regularly spend at least part of the year on the American continent north of Mexico, frequent its coastal waters, or appear as occasional visitors are currently divided into 708 species, of which 533 occur more or less regularly in eastern North America. Many of these also occur in western North America, in addition to the 175 species confined to that area. The 258 species covered in this book are the more primitive birds of eastern North America; i.e., those that comprise the first half of the A.O.U. check-list.

BIRD NAMES: Every bird has a scientific name formed of Latin and Greek terms. The name of a species consists of two words. The first, which is capitalized, is its generic or group name and is the same for all species in a genus. The second, which is not capitalized, is the bird's specific name; each species has its own.

Every species is also given an official English name in the A.O.U. check-list. In some cases this name as it appears in the latest edition differs from that in the preceding edition. In other cases we have been in the habit of using the English name of our local race rather than a name applicable to the species as a whole. In order to avoid confusion these other names are given in parentheses under the present official A.O.U. name. Currently an effort is being made to bring the British and American names of species that occur in both countries into agreement, but where this has not yet been accomplished the official British Ornithologists Union (B.O.U.) name is given in parentheses. Many additional names are in widespread local use and will be found in the Index with a reference to the A.O.U. name.

Since this book is concerned only with species, it is unnecessary to do more than point out in passing that many species are now being subdivided geographically into subspecies or races. In most cases the differences are so minute

as to have no significance in the field, and in some instances the question of whether to regard two similar but geographically separated bird populations as races or distinct species becomes a matter of judgment.

VARIATIONS IN APPEARANCE: It is important to remember that a bird may not look the same the year round and that male and female may not look alike. Where sexes have virtually the same appearance, the bird's name is followed by an asterisk (*). A young bird may not look like either parent, but if there is a difference between the sexes it usually resembles the female.

Newly hatched birds are usually covered with down or soon acquire a downy covering. As the bird grows this is soon replaced by the first true feathers which give it its *juvenile* plumage. Generally within a few months a molt starts which may take a short or long time to complete. As a result the *first winter* plumage may in some cases be subject to continuous change until sometime in the spring, and in a few cases there is little change until the *first prenuptial* molt in the spring. When in these subadult plumages birds are spoken of as *immature*, and in some species it takes several years of gradual change at each molt for an individual to become fully mature or adult.

Most birds regularly molt their body plumage twice a year and their flight feathers only once. These molts commonly occur in the late winter or early spring (i.e., the prenuptial molt which produces the breeding plumage) and again in late summer (i.e., the postnuptial molt which produces the fall and winter plumage). The flight-feather molt takes place in late summer, and in the waterfowl these feathers are all shed at one time, rendering the bird flightless for some weeks. In the drakes of the highly colored ducks this molt is preceded by a body-feather molt which produces a dull plumage rather like that of a female or juvenile. This is known as the *eclipse* plumage and is usually shed again as soon as the flight feathers have been replaced, the bird returning to its bright plumage, which is then worn for the next eleven months. In the duller geese and swan there is but one molt a year—the postnuptial—which is complete.

While this is a brief, generalized summary, the variations from family to family and species to species are infinite and give rise to many often puzzling plumages during the periods of change. This is especially true of juveniles and immatures,

the very individuals most likely to wander out of their normal range and, therefore, to puzzle the bird student.

Freak birds with white or paler-than-usual feathers are not uncommon, and complete albinos are occasionally found. Another variation is *melanism*, in which darker feathers replace those of normal color. A few birds, like the jaegers, occur in two colors or phases, irrespective of age or sex. Hybrids between species, while rare, are another possibility, especially among waterfowl.

COLOR PLATES: The color plates in this book are a key to the birds. An attempt has been made to illustrate every plumage except the downy and juvenile stages. During the short period when these are worn the birds are best identified by their close association with their parents. Usually the plumage extremes of any species are represented by the adult breeding male and the immature female. If other plumages are so close to one of these as to be unmistakable, they are not shown. Figures not labeled as to season may be assumed to be in breeding plumage. If not labeled as to sex, adults may be assumed to be virtually alike. If there is a marked difference between sexes in immature plumage, the duller female is usually shown and so labeled. All birds on a plate are drawn to the same scale.

Familiarity with the color plates will greatly increase the usefulness of this book. To add further value, it is suggested that you go over it species by species, checking the ranges as you go along, and mark in some way the birds apt to be in your locality. A convenient way is to underline the birds you may expect, using a distinctive color for each seasonal group: red for permanent local resident; green for summer resident; blue for migrant; brown for winter visitor; and some other color for accidental visitors that might occur occasionally after a storm or other disturbance.

The beginner will usually find that a detailed, annotated list of the birds that occur within his state or more local area is available for further guidance. These range from short summaries that have appeared in some ornithological journals to books like A. D. Cruickshank's *Birds around New York City*. They are commonly called "check-list" or "annotated lists," and the best ones give details on the local status, migration dates, and local habitats of each species.

MEASUREMENTS: In making an identification it is important to note the bird's general size. Size is very important in differentiating between closely similar birds, and tables have

been prepared to facilitate size comparisons. They are, however, based on averages, and it should be kept in mind that an occasional individual may deviate considerably from the average for the species as a whole. Nevertheless, it is a great help to have the sizes of a few of the most common local birds well fixed in your mind so that they can be used as a yardstick in estimating the size of unknown species. In the text the average length from tip of bill to end of tail (L.) is given. Where the ratio of tail length to over-all length has a decided effect upon the bird's appearance, the tail length in inches (T.) is given, and (B.) indicates the over-all length of the bill. If a bird is most commonly seen in the air the spread from wing tip to wing tip (W.) is given. Egg measurements are in inches, the maximum long diameter or axis by the maximum short diameter or thickness. All dimensions are average.

VOICE AND COURTSHIP: Unlike the passerine birds covered in the *Audubon Bird Guide to Small Land Birds*, most of the birds in this volume hardly have what could be called a song. They are often quite noisy, however, although the sounds they make are extremely difficult to describe satisfactorily. On the other hand, these larger birds generally have very distinctive and interesting courtship performances that are a fascinating field for study. A fuller understanding of the significance of the various sounds made by birds and the various posturings they go through in connection with each stage of their daily and annual routine is something toward which every amateur can contribute. Dr. Edward A. Armstrong's book, *Bird Display and Behavior*, provides an essential introduction to the subject and should be in every amateur ornithologist's library.

AGE: With the increased banding of wild birds by co-operators of the United States Fish and Wildlife Service, Washington, D.C., we are each year learning more about the migrations, mortality, sex ratios and longevity of birds. To date all the data indicate an extremely heavy mortality among juvenile and immature individuals and a greatly lessened rate once maturity is reached. The turnover in any population is, however, fairly high, a necessary concomitant of the high breeding rate most birds possess. In view of the low average age reached by the members of any species, it is interesting to note how long certain lucky individuals have been able to survive. Such a figure is given in this volume for the species

for which data are available. It probably represents the maximum potential life span in only a few cases.

RESEARCH PROJECTS FOR AMATEURS: Throughout this book numerous gaps in the data on average weight, wingspread, incubation period, and other aspects of the reproductive cycle of many species will be noted. In general it can be said that this indicates a lack in the ornithological literature of any but the most fragmentary and unreliable information on these points. This amazingly frequent lack of such basic data for even the most common species offers the amateur bird student a wonderful opportunity to make valuable contributions to science.

Although the data from a single individual or nesting pair are useful in the absence of any data at all, it is best to try to obtain the same material from a series of individuals or pairs. This not only insures against the error that is always possible in the recording of a single instance, but it makes possible the establishment of a more significant average figure.

Once obtained, such data, to be of any value to science, must be placed on record, where all interested ornithologists will have easy access to it. This can best be accomplished by submitting it for publication to one of the state or regional ornithological journals, of which some 25 are now appearing in the United States. These can be easily located through any public library or natural history museum.

RANGE AND SEASONAL MOVEMENTS: Some birds remain in one locality throughout their lives. Others migrate in winter to areas far south (north in the Southern Hemisphere) of their breeding grounds. The first are generally spoken of as residents, noted in this book by (R.), the second as migrants (M.). Many species fail to give such clean-cut examples. Migrants may be summer or winter residents, depending upon the observer's location. Often a bird appears to be a migrant only in the northern part of its range and a more or less permanent resident farther south. Often it is difficult to know whether this indicates a southward shift of the whole population or whether there are two population groups, one migratory, one sedentary. At any rate, wintering birds appear south of the breeding range, and there are species where the most northerly breeders are the ones that winter farthest south. Such species are referred to in this book as partially migratory (P.M.).

A few species wander erratically except during the breeding season, pausing wherever they find suitable food. As the

majority of these erratic wanderers (E.W.) belong to the North, most of us see them only in winter. Because of their irregularity in any given locality they are often called winter visitors rather than winter residents. Another group of erratic wanderers are southern species, chiefly herons, which breed early and come north during the summer in numbers that vary greatly from year to year.

In the section on range, if a bird is a permanent resident, its over-all range is given. If it is a migrant, its breeding range is given first, followed by its winter range, in which case it can be assumed that it is a migrant between the two. Only where breeding and wintering ranges are widely separated and the birds follow a rather well-defined route between the two is the route specified. For dates of arrival and departure, one should consult a local check-list or make one's own.

Although oceans are sharply divided into shallow and deep areas, cold and warm areas, those rich in nutrients and plankton life and those that are virtually lifeless, each with its characteristic birds, powerful storms often carry these birds far from their normal haunts. As a result, this volume includes many birds that wander occasionally to our shores or coastal waters although their normal range lies far away. To avoid confusion it is best to mark their pictures, as they are not something to be looked for every day but only when a puzzling newcomer fails to fit any of the plumages of the local residents.

FIELD STUDY: As many of these birds will be observed at some distance over water, the use of powerful binoculars or telescopes is a great help in their study. Hand-held (with or without a rest) binoculars up to 16- or 18-power are a great help. Excellent telescopes or tripod binoculars are also available at even higher powers and often open up such an extensive water area to observation that an entire day's birding can be done from one spot.

At other times extremely close observation of these birds is possible if you can station yourself near a nest or favorite feeding ground. For this a blind is a great help and will often permit the taking of excellent still and motion pictures of such activities as courtship. A blind can be made of local vegetation or burlap fastened to a permanent frame or need be no more than an old fish net draped over your head and body to break your outline as you sit on the ground.

CONSERVATION: Active steps for their conservation are needed

more by the birds in this volume than by most of the smaller birds. Some are game birds that can easily be overshot if hunting regulations are too liberal or are not conscientiously observed. Many are so large that they offer tempting targets to the thoughtless. Others, like the hawks and some of the fish eaters, are frequently killed by farmers, ranchers, and fishermen even though science has demonstrated their intrinsic value as components of a healthy, balanced wildlife community.

For many the most critical factor is the highly specialized nature of the habitat that they require either for nesting or for year-round residence. This, added to the intolerance of disturbance that is shown by so many species, makes it essential for us to plan to keep certain areas free from the influences of civilization—influences that if not subject to conscious checks seem destined to reach into every corner of our once seemingly spacious continent as population pressure increases year after year. A start has been made in our National Parks, our National Forest Primitive Areas and our Wildlife Refuges, but more needs to be done and the time left to do it is none too long.

Especially serious is the plight of many of the colonial nesting water birds. Even where their habitat and feeding grounds remain relatively unimpaired, many species are finding it harder and harder each year to find nest sites. Islands are being occupied by summer resorts, or visited daily by picnickers, and secluded swamp woodlands are either being cut or made increasingly accessible to the public by roads. Yet often the sanctuary or reservation that would be necessary to preserve a breeding colony that could enliven the countryside for miles around with attractive birds need not be more than a few acres.

In the main, these are not projects for the Federal Government or even for state governments; they are projects for public-spirited individuals who appreciate what the presence of bird life can mean to a community both economically and aesthetically. Others can be handled by small local groups banded together by a common interest in birds and a desire to do something to insure their preservation for the enjoyment of future generations; generations that may, as civilization becomes ever more omnipresent, value bird life and the chance to study and enjoy it even more than we do.

Acknowledgments

In preparing this book I have drawn freely upon the literature on North American birds which has been accumulating for more than two hundred years. I myself have had the privilege of studying birds in every state of the Union, but I have made full use of the recorded observations of others. Only in this way would it be possible to present a well-rounded picture of each species throughout its range.

I owe an especial debt to Arthur C. Bent, whose *Life Histories of North American Birds*, published in many volumes by the United States National Museum, provide a thorough abstract of the extensive and widely scattered literature on birds. I have also found the published works of such outstanding naturalists as Arthur A. Allen, Frank M. Chapman, A. K. Fisher, Francis H. Kortright, W. L. McAtee, Robert C. Murphy, Roger T. Peterson, Thomas S. Roberts, and Witmer Stone of special help. V. C. Wynne-Edwards's summary of his own field work and that of others in his report, "On the Habits and Distribution of Birds in the North Atlantic," and Warren F. Eaton's "List of Birds Recorded from the Bermudas" provided much helpful data on the birds of the vast and ornithologically little-known Atlantic. For data on food habits I have had to lean heavily on the many published studies of the Food Habits Research Division of the United States Fish and Wildlife Service and its predecessor, the Biological Survey. My range paragraphs are an abbreviation of the data in the fourth edition and more recent supplements of the American Ornithologists Union's *Check-list of North American Birds*.

Don Eckelberry, in my opinion, has made an outstanding contribution to ornithology in his illustrations for these books. On his behalf and my own I wish to thank the American Museum of Natural History and the Cleveland Museum of Natural History for their patience in making available typical skins for use in preparing both the paintings and the identification text. I am also greatly indebted to Earl L. Poole of the Reading Public Museum for taking time from his many other activities to do the fine black-and-white drawings that so enliven the text pages.

To the National Audubon Society and its directors, who have made it possible for me to undertake this book and have honored me by sponsoring it, I owe an especial debt of gratitude.

For the helpful suggestions and other courtesies I am also indebted to the following: Robert P. Allen, Dean Amadon, John H. Baker, James Bond, Charles L. Broley, Donald G. Carter, James P. Chapin, Allan D. Cruickshank, Jean Delacour, Monica de la Salle, Ludlow Griscom, Nella Braddy Henney, Joseph J. Hickey, Eleanor King, John Lynch, Ernst Mayr, Robert C. Murphy, J. T. Nichols, Charles E. O'Brien, Roger T. Peterson, Charles H. Rogers, Robert Seibert, Victor E. Shelford, Alexander Sprunt, Jr., W. E. Clyde Todd, Josselyn Van Tyne, Alexander Wetmore, Edward M. Weyer, John T. Zimmer, to my wife, Moira, who doubled as my secretary throughout the preparation of the manuscript, and to the many members of the staff of Doubleday and Company who have been so helpful, especially Clara Claasen and Sabra Mallett.

RICHARD H. POUGH

Pelham, New York

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Standard Abbreviations Used in Text

※	Color plate number	L.L.	Length of legs in inches
*	Sexes similar in appearance	Wt.	Weight in pounds and ounces (grams for very small birds)
♂	Male	R.	Resident; i.e., non-migratory
♀	Female	M.	Migratory
Jv.	Juvenile	P.M.	Partially migratory (found in some areas the year round)
Im.	Immature	E.W.	Erratic wanderer
n.	northern	Age.	Maximum age known to have been reached by an individual of the species in the wild
s.	southern	B. Age.	Normal age at which individuals first breed
e.	eastern	E.	Number of eggs in an average clutch
w.	western		
c.	central (between east and west)		
m.	middle (between north and south)		
mts.	mountains		
L.	Over-all length (tip of bill to end of tail) in inches		
W.	Wingspread (tip to tip) in inches		
B.	Length of bill in inches		
T.	Length of tail in inches		

Br.	Number of broods normally reared in a season	N.C.	Average number of days required for the construction of the nest
A.	An altricial species; i.e., one in which the young remain in the nest until nearly fully feathered and about ready to fly	E.L.	Days required from the time of the laying of the first egg for the completion of the clutch
P.	A precocial species; i.e., one in which the young leave the nest almost as soon as they are out of the egg	I.	Average incubation period in days
B. Ter.	The average size in acres of the territory defended by a pair when breeding	(2.8x1.9)	Average egg length and maximum diameter in inches
W. Ter.	The average size in acres of the territory defended by an individual or flock when established in an area for the winter	N.	Number of days that the young birds normally remain in the nest after hatching
C.	Average number of days of courtship preceding pair formation	D.	Average number of days that the young are dependent on the parents for food, shelter, or care of one sort or another after they leave the nest
		F.S.	Average normal flight speed

LOONS

Order Gaviiformes

LOONS

Family Gaviidae

Common Loon*

(Great Northern Diver)

Gavia immer—~~1~~ 1

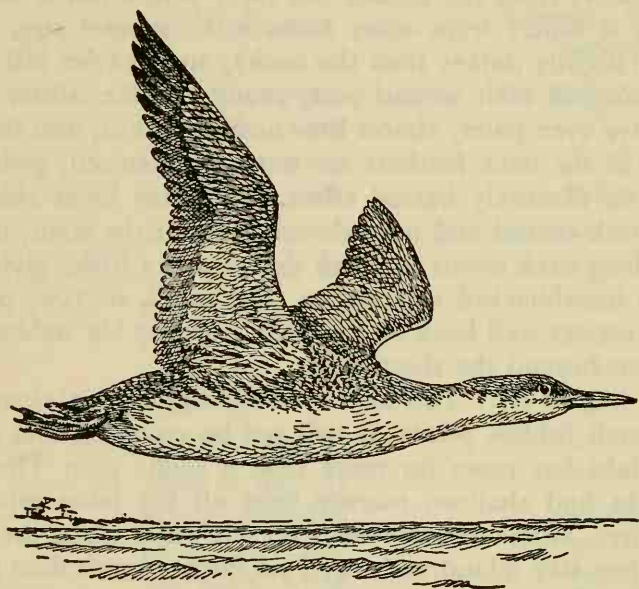
L. 28-34; W. 54-58; Wt. 5-9 lbs.

IDENTIFICATION: In breeding plumage the black bill separates this species from the similar but rarer yellow-billed loon. In winter it differs from other loons in its greater size, bigger head (slightly darker than the back), and heavier bill. Until the spring of their second year, young are like winter adults but have even paler, almost brown-colored bills, and the pale edges to the back feathers are more pronounced, giving the birds an obscurely barred effect. On water loons ride low, with neck curved and head down. In flight the stout, moderately long neck seems to reach downward a little, giving the bird a hunchbacked appearance. The small, narrow, pointed wings are set well back on the body, and the big webbed feet trail out beyond the short tail.

HABITS: (Age 8 yrs.) This loon breeds both on deep, clear lakes and small fishless ponds. It will not be crowded, and only a large lake has room for more than a single pair. The birds seem to find shallow, marshy bays off big lakes especially attractive. Most of them winter on salt water along the coast, but a few stay inland and travel no farther south than forced to by ice. Loons migrate singly or in small groups up to 5 or 6, but gather in considerable numbers in favorable feeding areas. Although they eat fish they also take a variety of other items—crayfish, crabs, amphibians, aquatic insects, shellfish, and vegetation—and seem able to get along entirely without fish. They catch fish in underwater dives averaging 30 to 45 seconds in length, during which they normally propel themselves with their feet, though occasionally the wings are also used. There are numerous records of loons being caught in fishing nets placed 180 and 200 feet below the surface. The feet are well adapted for swimming but are so far back on the body that on land the bird cannot stand upright or take flight and has to shove itself along on its breast. Even on water it cannot take off unless it has room for a long run into the wind.

VOICE: The weird, mournful, and loud, resonant calls vary from a tremulous *ha-ha-ha-ha-ha* to long-drawn-out yodeling howls that rise, then fall and fade away. These can be closely approximated by the human voice.

NEST: (I. 28, P., D. 45) A flat 2-foot mass of vegetation with a slight depression in the center, situated close to the water's edge or anchored in the water near the outer edge of a bed of reeds. Occasionally a muskrat house is used. The 2 olive-brown to olive-green eggs (3.5 x 2.2) are sparingly marked with small brown spots. The white-bellied, dark brown downy young swim within a day or two of hatching.



RANGE: (M.) Breeds from Iceland, c. Greenland, the Arctic Islands, and n.w. Alaska south to Massachusetts, n. Indiana, n. Iowa, Montana, and n. California. Winters from Nova Scotia, the Great Lakes, and s. Alaska south to Florida, the Gulf Coast, n. Mexico, and Lower California, and in Europe from the British Isles south and east to Madeira and the Black Sea.

Yellow-billed Loon*

Gavia adamsii—~~1~~ 1

(White-billed Northern Diver) L. 33-36; W. 60; Wt. 10-12 lbs.

IDENTIFICATION: The large bill, straw-colored with a brownish base, has a distinctive shape—straight along the upper edge and strongly upcurved below. Adults are glossed with purple, not green as in the common loon, and the back pattern is

bolder. The distinctive bill is slow in developing, and immatures, with bills dusky at the base and whitish only at the tip, are often hard to separate from those of other loons. The flight is powerful and fast, with head and bill pointed slightly upward.

HABITS: The fresh-water lakes, ponds, and rivers of the tundra are the home of this loon, which clings so close to the Arctic that it has always been a bird of mystery. It is evidently a late nester, as it is often encountered in early summer in areas where there is no sign of nesting activity, and it remains on many inland lakes and rivers until the last open water freezes over in the fall. Like all loons, these winter on salt water along seacoasts. To date there are almost no records of this bird on the East Coast. In winter its food seems to be largely fish.

VOICE: Similar to that of the common loon but said to be louder and harsher with an even more mournful, lonely quality.

NEST: (P.) A flat platform of mud a few inches above water on the edge of a lake or river. The slight hollow that holds the 2 dark-spotted warm brown eggs (3.5 x 2.2) is generally somewhat lined with vegetation. The light brown downy young are buffy above and nearly white below.

RANGE: (M.) Breeds from Foxe Basin west through the arctic regions of Canada (south to Great Slave Lake), Alaska, Siberia, and n. Europe to n. Finland. Winters off the coasts of s. Alaska and British Columbia, Siberia, Japan, and Norway.

Arctic Loon*

(Black-throated Diver)

Gavia arctica—~~II~~ I

L. 24; W. 40; Wt. 5 lbs.

IDENTIFICATION: This and the red-throated loon are much smaller than the two preceding birds. The proportionately smaller bill in this species is straight or downcurved. The gray head and nape and striped neck of summer adults are distinctive, and the white on the back is restricted to the scapular area. Winter adults are uniform blackish-gray above (slightly lighter on the head), and the contrast with the white under parts is stronger than in other loons. Young are similar but have a light edging to the back feathers which produces a slightly scaled effect.

HABITS: This is an adaptable, wide-ranging species. It nests on large lakes like other loons and also on small ponds, sloughs, and other patches of shallow water. In many cases the birds

fly back and forth long distances to larger bodies of fresh water or to the seacoast for food. The main wintering grounds seem to be well offshore along the coasts of southern and Lower California. In migration many hundreds may pass but always in small groups.

VOICE: The loud calls are weird and varied. The commonest is a harsh *kok, kok, kok*. Others are described as bloodcurdling howls, screams, and squeals that carry for great distances. Like all loons, these become comparatively silent after they leave the breeding grounds.

NEST: (I. 29, P., D. 60) Always close to the water or on a mound built up in shallow water. The nest varies from a lined depression on bare ground to a large mass of rotted stems, roots, and mud that scarcely raises the 2 dark-brown-spotted, olive-brown eggs (3.0 x 1.85) above the water. The downy young are brown above and drab below.

RANGE: (M.) Breeds in northern Europe, Asia, and in North America from the Arctic Islands and coast south to the James Bay area, n. Manitoba, c. British Columbia, and s.w. Alaska. Winters from s.e. Alaska to s. Lower California. Occurs rarely on the Atlantic coast.

Red-throated Loon* (Red-throated Diver)

Gavia stellata—~~1~~
L. 25; W. 44

IDENTIFICATION: This small loon has a slender bill, slightly uptilted at the tip, and its head and neck are rather slender. In summer the back is a uniform brownish-black, faintly flecked with white. In winter the white spotting is more conspicuous and the head and neck are white below and often rather light gray above. Young birds are browner and less spotted on the back, and the white about the head and neck is not as clear.

HABITS: These birds often nest on small shallow bodies of water just big enough to permit them to take off and land readily. In many cases most of their feeding is done elsewhere, frequently on nearby salt water. This active bird is less clumsy than the large loons and can, with some effort, walk upright. It is a fast, strong, and usually high flier, covering long distances with ease. When surprised it will often fly rather than dive and can practically jump into flight even on a windless day. Like all loons, red-throateds are curious and can often be brought close to shore by a fluttering handkerchief. Their food, while preponderately small fish like cape-

lin, sand launces, and herrings, runs the gamut of aquatic life from shellfish to insects.

VOICE: On breeding grounds this is a noisy bird, but at other times it calls rather infrequently. The commonest call is a prolonged, somewhat gooselike, rolling growl. There are others, a mewling wail, soft mews, and a loud *kark*.

NEST: (I. 26, P., D. 60) The nest is on a low flat area on the water's edge or built up in shallow water. It is never more than a flattened mass of moss and other soft vegetation and often is simply a hollow on bare ground. The 2 olive-brown eggs (2.8 x 1.8) are usually spotted with dark brown. The downy young are dark brown above and drab below.

RANGE: (M.) Arctic and northern areas around the world. In North America it breeds on the Arctic Islands and coast from Greenland to Alaska south to Newfoundland, c. Quebec, n. Manitoba, and the s. British Columbia coast. Winters, chiefly on salt water, from the Gulf of St. Lawrence, the Great Lakes, the coast of British Columbia, and the Aleutian Islands south to Florida and n. Lower California. Rare on the Gulf Coast.

GREBES

Order Colymbiformes

GREBES

Family Colymbidae

Red-necked Grebe*
(Holboell's Grebe)

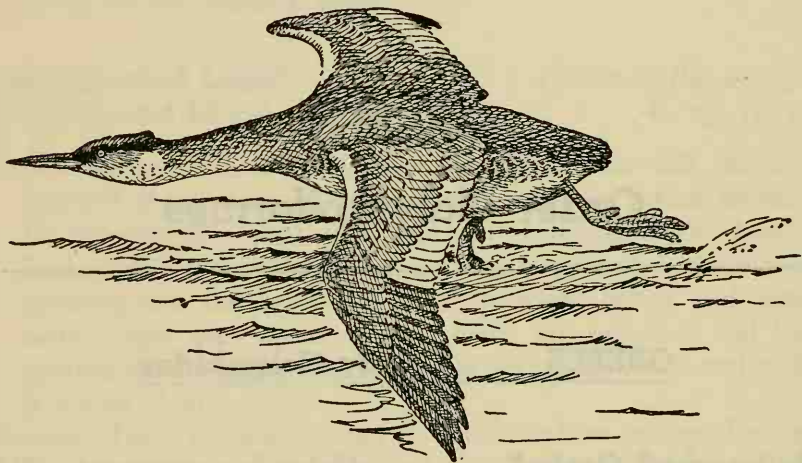
Colymbus grisegena—~~2~~
L. 19½; W. 31; Wt. 3 lbs.

IDENTIFICATION: This short-bodied bird has a long slim neck and a triangular head which is carried erect. Winter adults are best told by the yellow base of the bill, the gray neck, and the vertical white area behind the grayish cheeks. The head and checks of young birds are striped with black and white and the neck is rufous; the stripes are generally lost in fall, but the neck color may persist. This grebe's flight is

loonlike, but the wings have conspicuous white areas on the leading and rear edges of the inner wing.

HABITS: The summer home is a marshy lake or a deep marsh with many channels and pondlike openings. The bird is generally shy. Ordinarily it rides high in the water with its head nodding back and forth as it swims, but it can reduce its buoyancy by compressing its feathers and sink out of sight before it is noticed. Often the downy young scramble to the parent's back, where they can hang on even through a dive. In winter most of these grebes migrate to salt water and feed just outside the breakers or in protected bays. A few stay in large bodies of inland water, leaving only if they freeze over. Like most birds of its group, the red-necked takes a variety of aquatic food. Fish, though eaten, are not essential, and the birds often nest on fishless ponds. In general they eat whatever small aquatic animal life is most abundant and therefore easiest to obtain.

VOICE: The distinctive courtship notes vary from loud piercing brays or wails to vibrant squeaks or whinnies. The call is a nasal *konk*, said to suggest a donkey's bray.



NEST: (I. 23, P.) A floating mass of soft or rotted aquatic vegetation placed in the open on a bed of submerged plants or in a stand of broken-down reeds. The 4 or 5 unmarked whitish eggs (2.3 x 1.4) are soon stained and muddied. The downy young are almost black above, lighter below, with boldly striped heads and necks.

RANGE: (M.) Most of the Northern Hemisphere north to the Arctic Circle. In North America it breeds from n. Ungava,

n. Mackenzie, and n.w. Alaska south to s.w. New Brunswick, s. Ontario, c. Minnesota, n.w. Montana, and c.n. Washington. Winters, chiefly coastwise, from Maine, s. Ontario, s. Wisconsin, and s. British Columbia south to North Carolina, Tennessee, and s. California.

Horned Grebe*
(Slavonian Grebe)

Colymbus auritus—~~2~~
L. 13; W. 24; Wt. 1 lb.

IDENTIFICATION: This compact little bird rides high in the water and has a rounded head outline with slightly puffed cheeks. In swimming, the neck is somewhat curved or thrust forward. Summer adults need no description. In winter the clear white of the neck and cheeks, extending almost across the back of the head, is distinctive. This species flies more readily than most grebes, with a strong, direct, loonlike flight, revealing a large white patch at the rear of the inner wing.

HABITS: Small ponds, sloughs, and shallow bays of large lakes are the summer home. Often several pairs are present on a small pond, and in more extensive habitats loose colonies of 4 to 6 pairs are formed. The birds are not shy and sometimes nest with little concealment. When migrating they occur inland on rivers, lakes, and ponds, staying often until these freeze over. The main winter home is on salt water in the open ocean beyond the surf or in sheltered bays and sounds. Like loons, grebes catch their food in long dives under water. The horned starts with a pronounced upward and forward leap and propels itself under water solely with its feet. Its food includes fish, insects, crayfish, tadpoles, shrimp, and some vegetable matter.

VOICE: The commonest call on the breeding grounds is a low, uneven trill. The bird also utters a variety of croaking, chattering, and squealing notes, often with a mournful or plaintive quality.

NEST: (I. 24, P.) A floating mass of mud and vegetation in water up to several feet deep. Nests are generally anchored to, and often well concealed by, emergent vegetation. The 4 greenish-white eggs (1.7 x 1.2) soon become mud-stained. The downy young are black, finely striped and spotted with white.

RANGE: (M.) Occurs over much of the Northern Hemisphere. In North America breeds from s.w. Ungava, n. Manitoba, n. Mackenzie, and c. Alaska south to e. Maine, s. Ontario, s.

Wisconsin, n. Nebraska, n. Wyoming, and s. British Columbia. Winters from Maine, c. New York, the Great Lakes, and British Columbia south to Florida, the Gulf Coast, and s. California.

Eared Grebe*

(Black-necked Grebe)

Colymbus caspicus—~~2~~

L. 13; W. 22½; Wt. ½ lb.

IDENTIFICATION: The eared grebe has a finer bill with a tip that appears upturned, a slimmer neck, a more upright carriage, a more triangular head, and more white on the wing than the horned grebe. Its short, dumpy body usually seems very high-sterned. In summer the black crest and neck are distinctive. In winter the white of the cheeks and neck is not so pure or extensive but is washed, often unevenly, with gray. In young birds there is little color difference between cheek and crown.

HABITS: The eared grebe frequently nests in dense colonies in which several hundred pairs are crowded into a limited area, but smaller groups or single pairs are also common. Shallow, marshy lakes or marshy sections of large lakes are its summer home. The gregariousness of the species continues through the winter, when it commonly feeds in flocks. The main migration is southwestward to salt water, but some birds remain all winter on fresh water. On inland water, aquatic insects are a staple food—one bird took 1,300 water boatmen in a single meal. In many areas wind-blown land insects are important. Small shrimplike crustacea are evidently the bird's chief food on salt water.

VOICE: This is not a noisy bird and its calls have a soft quality. A common one is a *poo-eeep*, *poo-eeep*, with a rising inflection. It also utters an emphatic, rapid 3-note call in a wheezy voice.

NEST: (I. 21, P.) The very small, ill-constructed nests are little more than a heap of soggy vegetation floating in shallow water or resting on a bed of submerged aquatic plants or rubbish. Often, instead of concealing them in reeds, the birds appear deliberately to seek an open area. The 4 or 5 whitish eggs (1.7 x 1.2) often lie in a little water and are soon stained brown. The downy young are black and dusky with light streaks and spots.

RANGE: (P. M.) Occurs throughout Europe, Asia, s. Africa, and w. North America. Breeds from n. Iowa, c. Manitoba, s. Mackenzie, and c. British Columbia south to s. Texas, n.

New Mexico, and s. California. Winters chiefly on the Pacific coast from Washington to Guatemala, appearing only rarely on the Atlantic coast.

Least Grebe*
(Mexican Grebe)

Colymbus dominicus—~~2~~ 2
L. 9; W. 14

IDENTIFICATION: The diminutive size of this short-necked grebe and its whitish-tipped, small black bill are distinctive, as are the largely white flight feathers of the wing. Winter adults have a white or partly white throat and lack the black crown. Young are similar, but the bill is even smaller and its lower half is pale.

HABITS: Almost any body of fresh water is likely to have a pair or more of these abundant little grebes. When nesting they make little use of protective cover but place the nests in open water. The bird is shy, however, and if disturbed quickly sinks out of sight to come up in the concealment of a clump of reeds.

VOICE: A loud, trumpetlike *clang* note.

NEST: A small floating heap of old vegetation and mud, anchored in an area of fairly deep, open water. The 3 or 4 whitish eggs (1.3 x .92) soon stain brown. The downy young are blackish-brown, striped with white.

RANGE: (R.) Occurs from s.e. Texas and s. Lower California south through tropical South America and in the West Indies.

Western Grebe*
(Swan Grebe)

Aechmophorus occidentalis—~~2~~ 2
L. 22-29; W. 30-40; Wt. 1½ lbs.

IDENTIFICATION: The very long, slender neck, greenish-yellow, slightly upturned bill, and the gleaming white under parts contrasting strongly with the dark gray above are distinctive. In winter, when the under parts are slightly duller, the contrast is less. In flight the rear half of the wing is extensively white.

HABITS: These grebes nest in well-defined colonies in the marshy borders of large lakes and in wide shallow sloughs filled with tall marsh vegetation. The colonies vary in size from a dozen to hundreds of pairs. All loons and grebes have interesting courtship performances, of which the western's is typical. Paired birds repeatedly throw their heads back almost to their tails, then suddenly rise out of the water and run along the surface side by side, neck up and body almost vertical. The climax is reached when the birds rear up and

circle breast to breast, treading water so rapidly that most of the body is exposed. When these grebes migrate west to the coast it is generally in large flocks. On the coastal bays and lagoons great numbers are found together on favorable feeding grounds. They apparently depend more heavily on fish than other grebes. For some unaccountable reason all grebes have the habit of eating and retaining in a ball in their stomachs large quantities of their own feathers—numbering 331 in the stomach of one western.

VOICE: The common note is a loud, rasping, squeaky whistle which suggests the note of the osprey. It also utters a low, rolling croak.

NEST: (I. 23, P.) A large, often floating, mass of both dead and green marsh vegetation. Although the nests are sometimes in fairly deep water they float high and are always anchored to, and frequently well hidden in, a growth of reeds. The 3 or 4 eggs (2.3 x 1.5) are at first bluish-white but soon stain. The downy young are solid mouse gray above and pale gray to white below, without stripes.

RANGE: (M.) Breeds from c. Manitoba, n. Alberta, and c. British Columbia south to c. South Dakota, w. Nebraska, c. Utah, and s. California. Winters on the Pacific coast in coastal and adjacent inland waters from s. British Columbia to s. Mexico. Rare on the Atlantic coast.

Pied-billed Grebe*

Podilymbus podiceps—~~2~~
L. 13; W. 23; Wt. 1 lb.

IDENTIFICATION: The thick, blunt bill of the pied-bill is distinctive even in winter, when it is dusky-colored and lacks the black band. This is the only grebe that does not show a white patch on the wing in flight and is the brownest in general appearance. On water it ordinarily holds its tail high enough to reveal its white under tail coverts.

HABITS: This is the common "helldiver" of the East. Any pond or sluggish stream with shallow reed-grown banks or other cover is likely to harbor a nesting pair. They also occur in extensive marshes if the water is deep or the area is interspersed with openings and channels. One of the shiest of the grebes, this one manages to keep out of sight so well that its presence is often unsuspected. If surprised it can slowly submerge until only its bill is visible or swim under water to the nearest cover where it can emerge unseen. In spring it goes north very early and often does not leave in the fall

until the ponds freeze. It generally sticks to the same sort of fresh-water habitats throughout the year, but a few work coastwise and turn up in shallow bays and salt-marsh channels when inland habitats freeze over. A variety of aquatic animals, including fish, snails, frogs, tadpoles, and insects, are taken as food.

VOICE: A series of a dozen or more loud, resonant, cuckoo-like *cow-cow-cow* notes is the common springtime call. It also has other wailing and grunting notes.

NEST: (I. 23, P.) A generally well-concealed mound of soft plant material resting on a large floating mass of dead plant remains. It is sometimes in water several feet deep but is always well anchored to growing vegetation. The rim of the nest is of loose material that the bird pulls over the eggs to hide them when it goes away. The 5 to 7 blue or green-white eggs (1.7 x 1.2) are soon stained with brown. The newly hatched young, which are strikingly striped with black and white, are very active.

RANGE: (P. M.) Breeds throughout most of the Western Hemisphere north to Nova Scotia, s. Ontario, c. Manitoba, s. Mackenzie, and c. British Columbia, and south to s. Argentina. Winters from New York south along the Atlantic coast, in the Southern States, and from s. British Columbia south along the Pacific coast.

ALBATROSSES and ALLIES

Order Procellariiformes

SHEARWATERS and FULMARS

Family Procellariidae

Sooty Shearwater*

Puffinus griseus—~~20~~
L. 17; W. 42

IDENTIFICATION: This slender-billed, narrow-winged shearwater is characterized by its over-all sooty brown-black coloring.

The underwing coverts, however, vary with the individual from white to pale gray and the chin-throat region from dark gray to pale gray.

HABITS: The sooty shearwater is widely dispersed over the oceans of the world during its non-breeding season. It seems more attracted to coastal waters than other species. In the Atlantic the birds work north off our coast in May and June, few appearing on the European side until late summer. They most commonly occur as scattered individuals associated with other shearwaters on favorable feeding grounds such as off-shore fishing banks. Occasionally flocks numbering into the hundreds are encountered. In the eastern Pacific they travel in vast flocks that often take the form of a huge circle around which the individual birds keep moving as they feed. Here they migrate north and south so close to land that hundreds of thousands are sometimes seen from points on the shore. Staple foods seem to be squids, small fish, and crustacea. These are found close to the surface, but the birds to a limited extent can dive and swim under water. Shearwaters and petrels are inordinately fond of oily fish livers and often materialize out of nowhere when chopped liver or fish oil is thrown overboard at sea.

VOICE: A squawk or cackle. On breeding grounds it is very noisy, uttering many weird, guttural, choking sounds.

NEST: (I. 56, A., N. 95) The nest is in an underground chamber lined with plant material at the end of a 3- or 4-foot burrow in open ground. The elongated egg (2.9 x 1.9) is white.

RANGE: (M.) Breeds from November to March in s. New Zealand, Chile, and on many islands of the subantarctic seas. Migrates north over the oceans of the world as far as Labrador, Iceland, Norway, and the Aleutians.

Common Shearwater*
(Manx Shearwater)

Puffinus puffinus—~~20~~
L. 14

IDENTIFICATION: This medium-sized blackish shearwater resembles the little dusky shearwater, but it flies like its larger relatives, gliding on rigid wings for long periods, interspersed occasionally with a few rapid wingbeats. Its chief points of difference are its shorter tail with long white under tail coverts extending to the tip, and its gray cheeks. Its feet and legs are a gray-tinged pale pink.

HABITS: (Age 12 yrs.) Breeding colonies are generally in grass-covered areas on small coastal islands, though a few nest

in rocky areas or on inaccessible mainland cliffs. Around the colonies the birds are active only at night. The incubating bird may not be relieved for as long as 5 days, the feeding member of the pair apparently wandering off as far as 500 or 600 miles. The young are abandoned when about 2 months old, and after an 11- to 15-day fast they venture forth and awkwardly make their way overland to water. This shearwater seems to have an affinity for coastal shelf waters, but, unlike many of its relatives, it pays little attention to boats. Its known foods are small fish and squids, in pursuit of which it sometimes dives and swims under water for short distances with the help of its wings. There are few records of the bird along our coasts.

VOICE: A babel of guttural, half-strangled clucking or cooing notes, heard only at night and chiefly about breeding colonies. There appears to be much individual variation in tone.

NEST: (I. 53, A., N. 72) Underground, often 6 feet or more below the surface, at the end of a burrow which many times is the abandoned home of a rabbit. Also in rock crevices. The single egg (2.4 x 1.6) is white.

RANGE: (M.) Breeds from Iceland to Madeira, east to the islands of the Aegean Sea, and at one time on Bermuda. It migrates south in August to largely unknown wintering grounds that extend at least as far south as the Argentine coast. It returns north in February and March. Rare in the w. North Atlantic.

Dusky Shearwater*
(Audubon's Shearwater)

Puffinus lherminieri—~~20~~
L. 11½

IDENTIFICATION: This bird is even more sharply black and white than the much larger, heavier common shearwater. Its tail is proportionately longer, the under tail area dark gray, and the cheeks white. The fluttery flight, with short glides and much flapping, is very different from that of the larger shearwaters. The feet are slate-blue, the toes black.

HABITS: This shearwater of the Tropical Zone has a prolonged breeding season and seems to be a permanent resident of the seas near its breeding areas. Offshore the birds are often encountered in flocks, sometimes of considerable size. A common feeding habit is to drop down, with wings held high, to a patch of floating seaweed over which they run with flapping wings. They also swim freely with all the buoyancy of ducks, dipping their heads from time to time to look under water.

Little is known of their feeding habits, but they probably depend largely on small flying fish and squids. They dive readily and often stay under water for considerable periods. VOICE: About the breeding areas at night they are noisy, uttering mournful, catlike mews and plaintive, liquid, twittering notes.

NEST: (A.) This bird nests in colonies close to the sea. Sometimes the nests are in burrows and at other times in natural cavities and crevices in rock outcrops. The single white egg (2.1 x 1.4) is laid on bare ground or in a loosely constructed nest.

RANGE: (R.) Breeds on Bermuda, the Bahamas, the Virgin Islands, the Lesser Antilles, and many oceanic islands in the equatorial zone all the way around the world. Occasionally wanders north off our coasts as far as New Jersey.

Great Shearwater*
(Greater Shearwater)

Puffinus gravis—~~20~~
L. 19; W. 43

IDENTIFICATION: The dark sooty-brown cap, contrasting strongly with the white cheeks and grayer neck, and the often extensively white-bordered upper tail coverts are distinctive. The under tail coverts are brownish, and the white of the underwing is broken by a series of brown markings where it meets the more or less brown-spotted sides and flanks.

HABITS: During early summer this bird—a lover of cold oceans—is the abundant shearwater off our North Atlantic coast. Occasionally it can be seen from land, but generally it stays 5 or more miles offshore. Like its larger relatives, the albatrosses, one of which has the greatest wingspread of any bird in the world (11 feet 4 inches), it has long, narrow wings, the most efficient sort for gliding or scaling. Flying close to the water, wings stiff and slightly decurved, these shearwaters utilize the updraft created when the wind is deflected from the curved surface of a wave. From time to time, as they slow down, they bank sharply into the full force of the wind, using their inertia to gain altitude for another glide down a wave trough. With this technique they are able to fly for miles on a windy day without once flapping their wings. On calm days they are very inactive and often have difficulty in getting off the water. To the fisherman of the Grand Banks this is the hag or hagdown which formerly was extensively used for bait and occasionally eaten. The birds' normal food is small fish like sand eels and squids, but they

follow fishing boats for scraps and, if necessary, dive to get them.

VOICE: Croaking sounds have been noted on breeding grounds.

When fighting over food or frightened, the birds utter peculiar grunting and wailing sounds.

NEST: (A.) A single white egg (3.0 x 1.9) is laid in a burrow in grassy ground.

RANGE: (M.) The only known breeding ground is on islands of the Tristan da Cunha group in the c. South Atlantic, but the bird is so abundant that it seems there must be others. It migrates north rapidly, chiefly through the w. Atlantic west of the warm waters of the Sargasso Sea, and is seen off our coasts in greatest numbers in late May and June. After this it scatters over the North Atlantic to Greenland, Iceland, and the Faeroes, concentrating on especially favorable feeding grounds like the Grand Banks. The southward fall movement is less clearly defined than that of spring.

Cinereous Shearwater*

(Cory's Shearwater)

Puffinus diomedea—~~20~~

L. 21; W. 45

IDENTIFICATION: The distinctive characteristics of this, our largest shearwater, are the gradual transition from pale sooty-brown on top of the head to the white throat; the uniform and rather pale color of the upper parts from head to tail; the absence or at most the slight suggestion of pale tips to the upper tail coverts; and the uniformly white underwing surfaces, sides, and under tail coverts. It has longer, narrower wings than the great shearwater and its stout, yellowish-brown bill is very different from that of the latter.

HABITS: This warm-water species summers largely south of the cold waters frequented by the great shearwater. It flies with slow, powerful wingbeats and does not hug the water as closely as does the latter. From August to early November, when surface temperatures are at their highest, this is the commonest shearwater off the New England coast, occurring in greatest abundance between Cape Cod and the eastern end of Long Island. When mackerel drive young herrings close inshore in late September and October, numbers of the birds can be seen from such promontories as Montauk Point, Long Island. Their habit of following feeding schools of such predaceous fish or whales often helps fishermen, whose boats they also follow, to locate their quarry.

VOICE: On breeding grounds all through the night the birds

utter both harsh, guttural wails and purring notes.

NEST: (A.) In burrows in the ground or in crevices and holes in rock. When an extensive cave is available it often supports a large colony, every cranny and niche being occupied by a pair of birds. In these cases no nest is constructed and the single white egg (3.0 x 2.0) is laid on bare rock.

RANGE: (M.) Breeds on islands in the Mediterranean and from the Azores to the Cape Verde Islands, also Kerguelen Island in the c. South Indian Ocean. Wanders west and north to the Gulf Stream after breeding, occurring off our coast as far north as Cape Cod, and occasionally off Nova Scotia, from mid-July to December. Winters in the South Atlantic.

Black-capped Petrel*
(Diablotin)

Pterodroma hasitata—~~20~~
L. 15; W. 38

IDENTIFICATION: The dark crown of this heavy-billed and heavy-bodied petrel is sharply accented by the pale or almost white neck, nape, and forehead. Its long, white tail coverts reaching nearly to the end of the tail both above and below are characteristic. This species has a dark phase in which it is a uniform sooty-brown except for white upper tail coverts.

HABITS: This once abundant petrel is today a bird of mystery whose present breeding grounds are unknown, although it is still seen occasionally at sea. It is never active about its nesting burrow during the day, but hunters are able to locate the occupied ones with the help of a dog. To secure the bird it is necessary only to insert a long stick, as the bird will grab the end with its bill and allow itself to be dragged out. As other petrels have survived centuries of similar persecution, it seems likely that the recent introduction of such predators as the Norway rat, mongoose, and opossum into its former haunts has been the major factor in its disappearance.

VOICE: The call heard at night around the breeding grounds is described as mournful and owl-like.

NEST: (A.) In burrows which the birds dig in banks high up on mountain cliffs and steep slopes, often among the roots of trees. No specimens of eggs or young exist.

RANGE: (M.) Probably bred at one time on most of the islands of the West Indies, most recently on Dominica, Guadeloupe, Jamaica, and probably Hispaniola. Present extent of breeding range unknown. At other seasons it evidently wanders widely over the South Atlantic, as hurricanes have carried it inland as far as New Hampshire, s. Ontario, and Kentucky.

Bermuda Petrel*

(Cahow)

Pterodroma cahow—~~20~~

L. 15; W. 35

IDENTIFICATION: Closely related to the preceding species, the cahow lacks most of the white markings on the nape and has gray-tipped upper tail coverts that largely hide the white base of the tail.

HABITS: When first visited the Bermuda Islands were the nesting grounds of vast numbers of pelagic birds of at least 3 species—dusky and common shearwaters and the Bermuda petrel. The last named was apparently the most abundant of all, but it was good to eat and so fearless that it was ruthlessly exploited. One early account speaks of a single night's bag of 4,000. As early as 1616 the local governor issued an order designed to save them from extinction, but apparently he was too late. For almost 300 years these petrels dropped out of sight, but incredibly a few survived, and a small breeding population is still present on the outlying islets of the Bermuda group.

Oceanic birds like albatrosses, shearwaters, and petrels range over millions of square miles of water for some 8 months of the year, yet the entire population is dependent upon what often amounts to no more than a few square miles of breeding territory. Many find the essential freedom from mammalian predators on coastal islands, but others nest only on the truly oceanic islands, where they are also free from such avian predators as gulls and skuas. Undoubtedly our offshore waters were once well populated at certain seasons of the year by the oceanic birds that gathered to breed on the Bermudas—the only group of truly oceanic islands off the coast of e. North America. Now with it virtually eliminated as a nesting ground, we can no longer expect to see so many of them on offshore trips. Fortunately other oceanic species are still common, but no one knows what their future is likely to be as oceanic islands the world over come into increased use for air strips, meteorological stations, and naval bases. Seldom does man occupy an island long without bringing in his destructive pets—the cat and dog—and his even more destructive camp follower—the Norway rat.

VOICE: Heard only at night; described as a strange, harsh, hollow-sounding howl, like the word *cahow* or *cowhow*.

NEST: (A.) This bird nests in burrows or holes in rocks and lays a single white egg.

RANGE: Breeds on Bermuda. Range at other seasons unknown.

Fulmar*

(Fulmar Petrel)

Fulmarus glacialis—~~20~~
L. 18½; W. 41; Wt. 1½ lbs.

IDENTIFICATION: The short neck, stubby yellow bill, and the narrow, nearly straight wings without black tips separate the fulmar from any gull. Every color gradation occurs, from white-bodied birds with gray backs, wings, and tails to birds that are completely gray, but most individuals are clearly in either the dark or the light phase, the proportion of each varying widely from one breeding colony to another.

HABITS: Except when nesting, the fulmar is strictly pelagic, observable only on the high seas beyond the 100-fathom line, which is beyond the range of all gulls except the kittiwake. It is an abundant species (Darwin considered it the most abundant bird in the world) and in certain areas has greatly increased in recent years. Prior to 1877 there was only a single nesting colony in the British Isles, where today there are more than 200. For some reason (possibly because they are immature) there are always many non-breeding fulmars along North Atlantic steamship routes, even during summer. The maximum concentration off our coasts occurs in early September, but great numbers stay on the fishing banks until the spring migration. Most members of this group are not ship followers, but the fulmar is, and often rides the updrift close astern or to leeward, thus permitting observation of the curious nostril tubes on the top of the bill that are characteristic of albatrosses, shearwaters, and petrels. In flight (3 or 4 flaps and a soar) and feeding the fulmar resembles shearwaters, although it flaps more frequently. It feeds on the more important plankton animals, such as squids, jellyfish, and crustacea (shrimp, etc.), as well as on small fish, and it scavenges voraciously for oily fish wastes.

VOICE: A variety of low, guttural chuckling or cackling sounds and occasionally a nasal grunt.

NEST: (I. 48, A., N. 53) On a steep slope or cliff overlooking the ocean. There are a few inland colonies, one being 20 miles from the sea on a mountain slope running up to 3,000 feet in elevation. The single white egg (2.9 x 2.0) is laid on bare rock or in a slight hollow in the earth lined with a little plant material.

RANGE: (P. M.) Breeds in large colonies on islands off Cumberland Peninsula, Baffin Island, the coast of c.w. Greenland, Iceland, and the British Isles north and east to the c. Siberian coast, Wrangell Island, and the islands of Bering Sea. It is

a common oceanic species throughout the year, occurring south to the edge of the warm Gulf Stream, where it feeds about the large, floating masses of gulfweed.

STORM PETRELS**Family Hydrobatidae****Leach's Petrel***

(Leach's Forked-tailed Petrel)

Oceanodroma leucorhoa—~~20~~

L. 8; Wt. 1½ oz.

IDENTIFICATION: Not a ship follower, it is generally seen only at a distance, where it can best be identified by its very distinctive flight, somewhat like that of a nighthawk or a butterfly. The slow, irregular beats of its long wings give it a springy, bounding motion with frequent abrupt changes in direction, interrupted by short glides on stiff, down-flexed wings. When it settles on water for a moment to feed it holds its wings extended high over its back until it springs into the air again. Compared with other petrels, Leach's is larger and paler (lightest on the greater and middle wing coverts, which form a band along the front of the inner wing). The legs are short, the feet black, the tail forked, and the white rump is broken by a dark area in the center.

HABITS: (Age 7 yrs.) These petrels are widely distributed over northern oceans, even during the breeding season. Nesting birds apparently range up to several hundred miles from the colony when off on feeding expeditions, as the members of a pair relieve each other only about once every 4 days during the incubation period. The colonies are always on islands—open, grass-covered, or wooded—as the birds are very vulnerable to predatory mammals like foxes and rats. Many once thriving colonies have been wiped out by lighthouse keepers' cats and fishermen's dogs. Herring gulls and especially great black-backed gulls are potential enemies, which probably explains the petrels' nocturnal habits about the breeding grounds. Even so, the gulls, to whom a petrel is only a mouthful, take a heavy toll on bright moonlight nights.

VOICE: The common call heard at night is a series of 8 strongly enunciated low, guttural cooing or crowing notes. The birds have other softer, more liquid twittering notes, suggesting those of a bluebird, as well as harsh screams and a continuous purr or trill.

NEST: (I. 42, A., N. 50) In a chamber at the end of a shallow burrow from 1 to about 3 feet long which the birds excavate themselves and use year after year. The single egg (1.3 x .95) is white, occasionally finely marked with purple. It is laid in a loose nest of grass and twigs.

RANGE: (M.) Breeds on coastal islands of the North Atlantic and North Pacific from Massachusetts to s. Greenland and the British Isles, and from Lower California to the Aleutians and Kuriles. Ranges south in winter across the equator.

Storm Petrel*

Hydrobates pelagicus—~~20~~
L. 6

IDENTIFICATION: This tiny, long-winged petrel habitually follows in the wake of ships, fluttering back and forth from one side to the other with an unsteady moth- or batlike flight, broken only by the shortest of glides. The most distinctive marking is a small white area in the middle of the underwing. In fresh plumage a fine line of white can be seen along the inner part of the upper wing surface. The feet and legs are black and do not extend beyond the tail in flight.

HABITS: It has been rumored that this petrel breeds on our side of the Atlantic, but no nest has been found. The storm petrel's close resemblance to Wilson's makes it difficult to get reliable sight records in our waters where it might be expected most often in October or November. Birds seen in June or July would presumably indicate a breeding site in the general vicinity.

VOICE: A sustained, uneven, and rather harsh purring or churring sound. Also a more musical warbled chatter.

NEST: (I. 38, A., N. 61) In a cavity among loose stones or under large boulders, among ruins, and sometimes in burrows dug by the birds in soft ground. The single white egg (1.1 x .85) is often finely marked with brown.

RANGE: (P. M.) Breeds on islands in the e. Atlantic and w. Mediterranean from Iceland and n. Norway south to the Canaries and east to Malta. Ranges west in spring and fall as far as our northeast coast and south on both coasts of Africa to the Cape of Good Hope in winter.

Wilson's Petrel*

Oceanites oceanicus—~~20~~
L. 7; W. 15½; Wt. 1¼ oz.

IDENTIFICATION: Like the Leach's and storm, this is a small, white-rumped petrel, but its wings are shorter and more

rounded and its flight steadier; glides alternating regularly with swallowlike flutters. It is a ship follower and when feeding has a habit of "walking" on the water with outstretched wings held high and feet dangling. Its yellow-webbed feet and long legs project beyond the short, square tail.

HABITS: Only 3 Southern Hemisphere birds migrate north in large numbers to spend their winters in the Northern Hemisphere, in contrast to the hundreds that go south during our winters. Of these—the sooty and great shearwaters and the Wilson's petrel—the petrel is the most abundant and is regarded by some ornithologists as possibly the world's most abundant bird. It appears off our coasts in numbers in late May and stays until September. The Gulf Stream seems to be a favorite habitat; from it the birds move in to fishing banks and coastal waters. Occasionally great numbers are seen from shore, and they regularly enter such enclosed waters as those of New York Harbor.

Not nearly enough is known about the distribution of these and other pelagic birds, and everyone who is sufficiently familiar with them to distinguish them with reasonable certainty should keep a detailed log of species encountered during an ocean voyage.

All small petrel feed heavily on shrimplike crustacea but seem to take any plankton animals of proper size. They also take fish and waste matter of all sorts, commonly following feeding schools of whales and steamers to pick up scraps and gathering about fishing boats when fish are being cleaned.

VOICE: When feeding at sea they utter a rasping twitter and a soft peeping note. Croaks, chuckles, and whistles are among the notes described from breeding grounds.

NEST: (I. 39, A., N. 52) In cavities and crevices among loose rocks or under boulders or in cliffs. Less commonly in burrows in soft earth or peat. The single egg (1.3 x .95) is white, speckled with reddish-brown.

RANGE: (M.) Breeds on islands off the southern end of South America and on most islands in the Antarctic Ocean. Ranges north in its winter (our summer) to Newfoundland and the English Channel; i.e., to about Lat. 50° N.

Frigate Petrel*

(White-faced Petrel)

Pelagodroma marina—~~20~~
L. 8

IDENTIFICATION: The white under parts and underwing and the strikingly marked head are very different from those of any

other small petrel. Its flight is erratic and bounding and its orange toe webs can often be seen as it dangles its long legs while "walking" on water.

HABITS: A recent record of this bird off Cape Cod emphasizes how little we know about the frequency of occurrence of species like this which nest in the e. North Atlantic and may be expected to come into our offshore waters from time to time.

VOICE: Silent except on breeding grounds, where it makes typical petrel sounds.

NEST: The single white egg (1.4 x .85), finely spotted with reds, is laid in a shallow burrow in soft earth.

RANGE: Widely distributed as a breeding bird from the islands off w. Africa to islands in the Australian region. Wanders, at least occasionally, to the w. North Atlantic.

PELICANS and ALLIES

Order Pelecaniformes

TROPIC-BIRDS

Family Phaëthontidae

Yellow-billed Tropic-bird* *Phaëthon lepturus*—~~27~~
 (White-tailed Tropic-bird) L. 16 (immature), 32 (adult);
 W. 37; T. 5-21; Wt. 14½ oz.

IDENTIFICATION: This bird looks like a heavy-bodied tern but has a bold black-and-white wing pattern and a rapid pigeon-like wingbeat. Young lack the long central tail feathers but have a finely barred back and a yellow bill instead of the orange-red bill of adults. When the bird is seen from below in flight the dark flanks frame the rear half of the body with a narrow line of black.

HABITS: The tropic-birds are well named, as they all belong to the warm-ocean areas, this species being the most characteristic bird of the Sargasso Sea. Yet even in this area of clear and relatively unproductive water it is never abundant; generally only a single individual is encountered at a time, and

3 or 4 together are a rare sight. Squids and fish, especially flying fish, are staple foods and, near the shore, crabs. As squids rise to the surface only as the light fades and sink again as morning comes, the birds do most of their feeding early and late in the day. They obtain food in dives from considerable heights, usually hovering a moment before closing their wings for the downward plunge and often turning as they fall. On land tropic-birds are almost as awkward as loons and grebes, pushing themselves about on their breasts—a good reason why they always nest on cliffs or steep slopes. On water they float high with their long tail feathers well up in the air.

VOICE: A harsh, squeaky *tick-et-tick-et* is given repeatedly in flight.

NEST: (I. 28, A., N. 63) On a rocky shelf or ledge or in a natural pocket of rock, usually close to the shore, but occasionally some distance inland. Some nests are in extensive caves, others in shallow depressions scooped out on sloping ground under a bush. The single egg (2.1 x 1.5), pinkish, thickly speckled with brown, is laid on a bare rock. Two broods are reared.

RANGE: (P. M.) Breeds in Bermuda (early March to October), the Bahamas, most of the West Indies, and in the islands of the equatorial zones of the South Atlantic, s.w. Pacific, and Indian oceans. In fall it wanders widely over the Sargasso Sea region of the w. Atlantic, regularly coming as far north as Lat. 40°. Stray birds occasionally reach our coast.

PELICANS

Family Pelecanidae

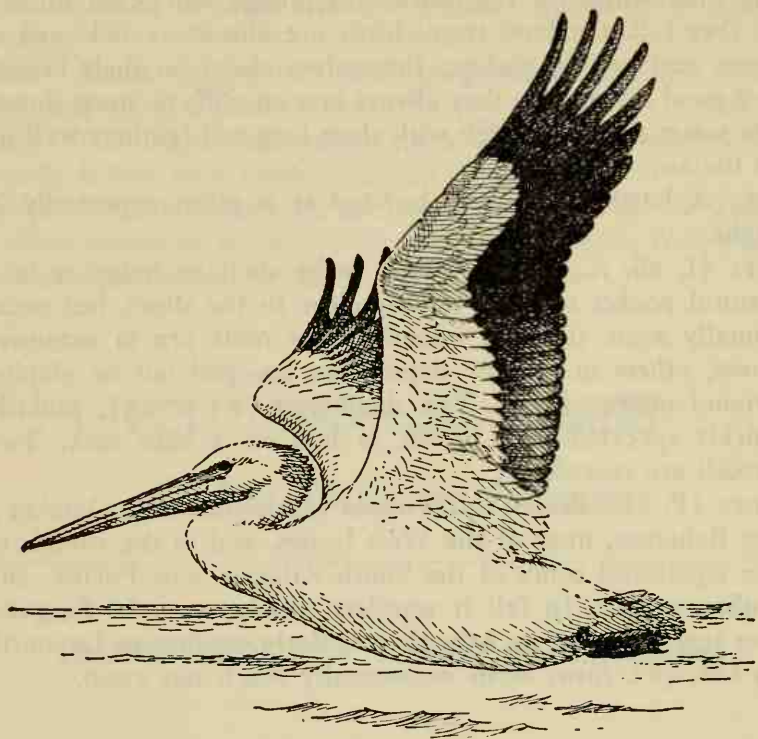
White Pelican*

Pelecanus erythrorhynchos—~~19~~
L. 60; W. 100; Wt. 15 lbs.

IDENTIFICATION: This pelican's large size, coupled with its lack of long legs or a long neck, is fairly diagnostic. The black area on the wing includes all the primaries and about half the secondaries, making the outer two thirds of the extended wing black along its rear half. Young differ only in having grayish instead of white lesser wing coverts and a brownish-gray cap on the head.

HABITS: (Age 8 yrs.) This heavy bird is a surprisingly good soarer and seems to enjoy circling in small flocks high in the

air, often returning to earth in a spectacular, almost vertical dive that ends in a sharp upturn accompanied by a thunderous roar. When traveling these birds form a V or a straight line and alternately flap and sail—each bird synchronizing its actions with the rest of the group.



In summer the white pelican requires for nesting an isolated island, reasonably close to the type of shallow water that is suited to its highly specialized fishing method. Large and small fish, mostly of non-game species, and other aquatic animals like salamanders and tadpoles are the chief foods. This is one of the few species of birds in which large numbers of individuals engage in what appears to be carefully planned and closely co-ordinated group action leading to the capture of prey that could not be obtained so efficiently in any other way. Having located a school of fish, the birds gather in a line offshore, wing to wing, and then at what seems like a signal from a leader they slowly move shoreward, beating the water with their wings and keeping an almost perfect line. This drives the fish into shallow water, where the

pelicans scoop them up into their pouches, drain off the water, and swallow them. With a wingspread that sometimes approaches 10 feet, the white pelican is the most spectacular bird that we have left in anything like its original numbers, but it must be constantly guarded against those who would destroy it for selfish or petty reasons.

VOICE: Silent except for a low croaking or grunting about the breeding grounds.

NEST: (I. 29, A.) In dense colonies on bare ground, more rarely on matted-down marsh vegetation. Earth and debris are drawn up to form a rim around the eggs, the nest occasionally becoming a low mound with a depression in the center. Two chalky-white eggs (3.5 x 2.2) are the normal clutch.

RANGE: (M.) Breeds from c. Manitoba, s. Mackenzie, and c. British Columbia south to c. North Dakota, n. Wyoming, n. Utah, and s. California and on the s. Texas coast. Winters from n. Florida, the Gulf Coast, and s. California south to the Florida Keys and Panama.

Brown Pelican*

Pelecanus occidentalis—~~19~~
L. 50; W. 80; Wt. 8¼ lbs.

IDENTIFICATION: This is a striking bird in any plumage. The white-striped, rich brown neck characteristic of the breeding plumage is replaced by a solid-white neck during the post-nuptial molt. Young birds have a brownish-gray neck, a browner back, and largely white under parts.

HABITS: (Age 12½ yrs.) The brown pelican is strictly a coastal species, never occurring inland or out of sight of the shore; and as its method of fishing requires clear water, it also avoids river mouths and other turbid areas. The birds commonly travel in small groups close to the water, gliding for long distances with only an occasional flap of their wings on the updraft behind a breaking wave. When fishing they maintain an altitude of 25 or 30 feet. If food is sighted, they turn sharply into a vertical dive, with beak thrust forward and half-closed wings trailing back, that carries them completely under water with a tremendous splash. The fish on which this pelican feeds are usually members of the herring family that occur in dense schools near the surface. Menhaden furnish most of its food along the Atlantic coast and careful studies have shown that the charge that pelicans seriously compete with commercial fishing is without foundation.

These birds are constantly harried by gulls, man-o'-war-

birds, and even terns, ever on the alert to steal part of their catch. Around nesting colonies gulls and other predators are always on the watch, ready to pounce on eggs or young left unguarded for even a moment, which is why one should never go near their breeding colonies, even for a short visit, during the early part of the nesting season.

VOICE: Noisy when young, making notes that vary from low grunts and barks to a shrill squeal. Adults seldom utter more than a low cluck.

NEST: (I. 30, A., N. 60) These pelicans seem to prefer to nest in low, brushy trees, but they also commonly nest on the ground. The site is usually on a small island in a shallow bay. The interval between breeding seasons in some colonies is less than a full year, so instead of recurring at the same time each year, the breeding season moves slowly around the calendar over a period of years. The nest varies from a well-built structure of sticks and miscellaneous trash to almost nothing in the case of some ground nests. The 3 eggs (2.9 x 1.8) are a dull, dirty white.

RANGE: (P. M.) Breeds on salt water from South Carolina and c. California south to Venezuela and c. Chile. Wanders north to North Carolina and s. British Columbia and south to the mouth of the Amazon and s. Chile.

BOOBIES and GANNETS

Family Sulidae

Blue-faced Booby*

(White Booby)

Sula dactylatra—~~19~~
L. 32; W. 63; Wt. 4¾ lbs.

IDENTIFICATION: The blackish-brown tail, wing tips, and entire rear edge of the wing are distinctive. The larger females have bills pink at the base while those of the males are bright orange-red. In both the area around the base of the bill is more black than blue. Young are smoky-brown flecked with white above with light areas where the neck joins the back and at the base of the tail. Like adults, they have dark wing and tail feathers and white under parts.

HABITS: Unlike most birds, boobies do not as a rule fly to escape man but stand their ground and defend themselves with their bills. This is evidently how they got their name; and it is true both of birds at the nest and of the occasional

individuals that alight on ships. The staple food of the blue-faced is flying fish (of which there are 65 known species), varied with a few squids. Squids are caught in sudden dives from heights of 25 to 30 feet that may carry the birds 10 feet under water. As flying fish live in schools near the surface of clear, warm waters far from land, these boobies often feed 100 miles or more from their nests. At other seasons they often wander even more widely, but never beyond a supply of flying fish. Occasionally they follow a ship to catch the fish they scare into flight. Frigate-birds constantly plague boobies and have been known to grab them by the tail while in flight to make them disgorge their catch.

VOICE: The female makes a quacking sound, the male a hissing whistle.

NEST: These birds nest in loose colonies on islands. An open or grassy slope or cliff top facing the ocean or to windward seems preferred. The 2 chalky, pale blue eggs (2.6 x 1.8) are laid in a shallow scrape on the ground. Although both eggs generally hatch, seldom is more than a single young bird reared.

RANGE: (R.) Breeds in the Atlantic from the Bahamas and islands of the Gulf of Mexico and Caribbean to South Trinidad and from islands off the w. Mexican coast across the Pacific to the Indian Ocean. Wanders to our Gulf Coast and occasionally north over the warm waters of the Sargasso Sea.

Brown Booby*

(White-bellied Booby)

Sula leucogaster—~~19~~
L. 29; W. 57

IDENTIFICATION: In adults the sharp line of separation between the pure white of the under parts and underwing coverts and the dark brown of the rest of the bird is distinctive. Young are rather gray-brown all over, a little paler on the belly and darker on the breast.

HABITS: This is the booby most commonly seen off our southern coast. Immature birds should not be confused with the much lighter young gannets. Brown boobies are active on the wing, flying sometimes close to the water in the troughs of the waves like shearwaters and at other times well up in the air with slow, steady wingbeats. These boobies eat a variety of fish, but in many areas flying fish and halfbeaks are the staple food, plus mullet. When a large school of fish is located the birds dive repeatedly in quick succession from only a few feet up in the air. Ashore they are apt to perch in a tree,

shrub, or other elevated point that will facilitate a take-off, which they find difficult in the absence of a strong wind.

VOICE: Hoarse cries, seldom heard except on the breeding grounds.

NEST: A low mound of trash or a hollow scrape in the ground suffices for a nest. It may be in an open, bare area or well covered with low vegetation and sloping to windward or, if flat, close to a sharp drop-off. Two pale blue to chalky eggs (2.4 x 1.6) are laid, but as a rule only a single chick is reared.

RANGE: (R.) Breeds in the Bahamas, West Indies, and on islands off both coasts of Central America and in many other parts of the Tropical Zone of the Atlantic and Pacific oceans. It once nested on the Dry Tortugas and still occurs there. It wanders to our coasts as far north as South Carolina (occasionally Massachusetts) and is the booby most likely to be encountered on the high seas.

Red-footed Booby*

Sula sula—~~19~~ 19
L. 29; W. 60

IDENTIFICATION: This small, long-winged, long-tailed booby occurs in several not very well understood color phases. White adults have only a narrow blackish-brown border on the rear of the wing (and a few spots of gray on the coverts), although the whole end of the wing is dark like a gannet's. Occasionally one of these birds has a brownish tail. Young are uniformly brownish, paler below. Some never develop beyond the stage where the head and neck become a paler brown and the tail and rump white. The feet and legs, however, change from the dull yellowish of the immature to the distinctive bright red of the adult.

HABITS: This is the only American booby that is at home in the branches of a tree and will not nest on the ground. Unfortunately, civilized man or his animals, most commonly goats or hares, have destroyed all the trees and shrubs on many former nesting islands and the red-footed is not as common as it was. Its complete dependence on trees is due to its inability to fly from the ground without first scrambling into a bush or tree. Fish and, to a greater degree than for other boobies, squids are standard foods, which probably explains why the birds have large eyes and are more active early and late in the day and at night. They have a graceful, buoyant flight and are often seen in a line or group of 5 to 20, alternately ascending during a wingbeat period, then

coasting to the wave tops in perfect synchronization. Fishing is done by diving from a height of 20 or 30 feet.

VOICE: The common call is a prolonged cackle.

NEST: (I. 45, A., N. 45) A rather loosely constructed flat platform of sticks and twigs in a bush or low tree. The single pale blue egg (2.5 x 1.6) has a rough, chalky covering. As with all boobies, the young are naked when hatched and must be carefully protected from the sun until their long, white down develops.

RANGE: (R.) Breeds in the West Indies and on other islands in tropical seas around the world. Occasionally seen off the Florida coast.

Gannet*

Moris bassana—~~19~~
L. 36; W. 72

IDENTIFICATION: The long, tapered tail, long wings, and the big bill that is kept pointed downward in flight are distinctive, as is the wholly black outer end of the wing. The white-flecked, brown-black young birds take 4 years to mature, the head, neck, and under parts becoming white first and the back and wing coverts last, which often gives them a blotched appearance. The head color of adults varies from orange-buff through various shades of yellow to white.

HABITS: (Age 16½ yrs.) The gannet is one of the few birds whose breeding population is at all accurately known. It breeds in 22 colonies which, when censused in 1939, gave a total of 167,000 birds. The 5 American colonies contained a total of approximately 14,000, as follows: Bonaventure, 7,200; Cape St. Mary, 5,036; Bird Rocks, 1,250; Gull Cliff, 496, and Funk Island, 7. This is a bird of coastal waters inside the edge of the continental shelf and is seldom seen more than 300 miles from land, even during winter. It is the young birds that make the longest migration and the old adults that winter farthest north. Although gannets nest in congested colonies and may travel in single file or small flocks, feeding groups are usually small. The birds fly with a rapid wingbeat, sailing at frequent intervals, and can soar to great heights as well as glide over the waves like shearwaters. Fish of all kinds, especially those that travel in schools close to the surface, like menhaden and herring, are almost their sole food. These are caught in spectacular diagonal dives from heights up to 100 feet or more in the air. It appears that with the help of their wings under water they occasionally

reach depths of 50 feet or more. Gannets are often seen from shore and can always be identified by their dives and the splash they make when they hit the water.

VOICE: Call at breeding colonies is a loud, hoarse, snoring note.

NEST: (I. 42, A., N. 100) A mound of seaweeds and trash on a cliff edge or on the slope above a cliff. The single egg (3.0 x 1.8) is pale blue with a chalky covering. The newly hatched young is naked and gray in color; its covering of white down is not complete until it is 3 weeks old. Feeding is stopped after 12 or 13 weeks, and the young fasts for about 10 days before it finally launches itself into the air from the edge of the nest ledge and half falls, half flies into the sea. Apparently it floats on water without food for an additional time before it is able to get into the air and start fishing for itself.

RANGE: (P. M.) Breeds on 3 small islands or rocks in the Gulf of St. Lawrence and 2 off Newfoundland; in Iceland, the Faeroes, and the British Isles. Winters from Virginia (rarely Cape Cod) to Cuba and the c. Mexican coast, and from British Isles to c. West Africa.

CORMORANTS

Family Phalacrocoracidae

Cormorant*

(European Cormorant)

Phalacrocorax carbo—~~18~~

L. 36; W. 61

IDENTIFICATION: The white area near the base of the heavy bill and the stocky neck that gives the bird a bitternlike appearance in flight are the only good year-round field marks for adults. From February or March through June they have a white patch on the thigh, a hoary cast to the head and neck, and generally a very yellowish throat pouch. Young can usually be distinguished by their large size and the rear under parts, which are whitish to the tail, but some individuals are no larger than the double-crested and some lack the whitish rear under parts.

HABITS: Years ago this bird was widely domesticated and trained for fishing in England and parts of Europe, a practice which continues to this day in China. It occurs in abundance over half the world, lives on both salt and fresh water, nests both in trees and on rocks, and the only reasonable explanation for its scarcity in North America seems to be that it

occupies a niche so close to that which is already filled by the double-crested cormorant that it can make little headway where the latter is present. The overlap between the two is small. Shallow waters of coastal bays and river mouths are preferred feeding grounds. In winter, when the birds come south of the rocky New England coast, they favor breakwaters. They consume a wide variety of fish.

VOICE: At the breeding colony various deep croakings and other guttural noises, each of which seems to have a distinct meaning.

NEST: (I. 28, A., N. 30+) Flat, broad ledges near the tops of cliffs overlooking water seem to be preferred sites for nesting colonies of this species, but the flat tops of rocky islets are also used, and in some places trees. The nest is a bulky mound of sticks, seaweed, and other material, built higher each year. The 3 or 4 eggs (2.5 x 1.6) are pale blue with a chalky covering.

RANGE: (P. M.) Breeds throughout most of the Eastern Hemisphere and in North America from w. Greenland and Baffin Island south to the Gulf of St. Lawrence. Winters regularly from its breeding grounds south to New York and casually to South Carolina.

Double-crested Cormorant*

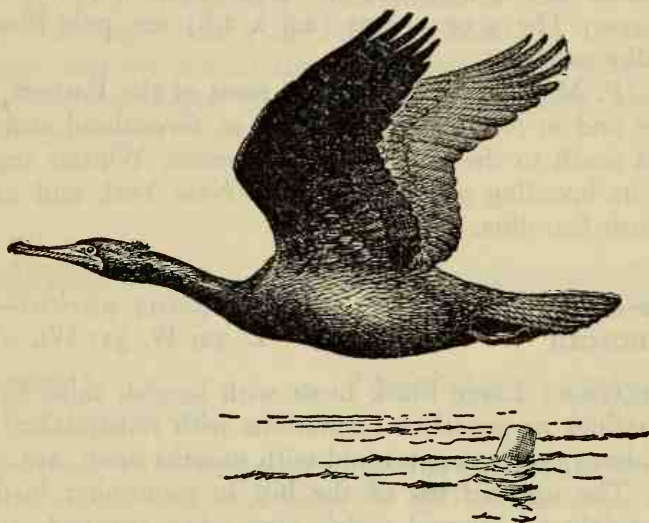
Phalacrocorax auritus—~~18~~
L. 32; W. 51; Wt. 4½ lbs.

IDENTIFICATION: Large black birds with longish tails, flying in long strings or gooselike formations with outstretched necks held above the horizontal and with mouths open, are cormorants. The upward tilt of the bill in swimming birds, the bolt-upright or "spread-eagle" pose when perched, and the occasional sailing periods in flight are distinctive. Young are more grayish and brownish and have rather pale under parts.

HABITS: (Age 14 yrs.) The double-crested cormorant is an abundant and widely distributed species nesting on salt or fresh water, by itself or with herons and other water birds in colonies of from a few to many thousands of pairs. In recent years it has suddenly become abundant along the New England coast, probably because of some not too well understood change that has increased its food supply. However, the largest colony of a million or more birds is still on the coast of n. Lower California. Grotesque courtship posturing by the male marks the start of breeding activities. When first hatched, the naked, coal-black young look like rubber toys,

but within 2 weeks they are covered with dense black down. Although they require about 7 weeks to get all their feathers and learn to fly, they wander freely about the colony and after they are about a month old will take to the water if disturbed.

Cormorants obtain their food by diving from the surface and swimming under water with the help of their wings to depths of from 5 to 25 feet. Extensive food-habit studies reveal that on salt water this species is invariably beneficent to the local fishing industry. The bulk of its food consists of trash fish like sculpin, cunner, gunnel, and eel that not only are of no commercial value but often prey upon and compete with valuable species. Perch, bullheads, carp, crappie, stickleback, and similar fish of small value, plus animals like salamanders, make up a large proportion of their fresh-water food.



Cormorants rapidly convert the greater part of what they eat into droppings containing a high percentage of nitrates and phosphates—the fertilizing elements most needed by aquatic plants. Thus the presence of a colony tends to stimulate the growth of diatoms and other algae—the basic support of all underwater life. There is little question that a colony, simply by increasing the over-all productivity of nearby waters, produces more fish, including game and food fish, than its members eat. This, coupled with the fact that the bird feeds preponderately on non-game fish and thus corrects the unbalance caused by highly selective commercial fishing, gives it a vital role in maintaining the yield of many coastal and lake fisheries.

VOICE: A wide variety of harsh, croaking sounds like *awk*, *hawk*, *oak*, and *oop*, seldom heard except at a breeding colony.

NEST: (I. 25, A., N. 25, D. 35) Nests are placed on top of rocky islets, on cliff ledges, or in trees. Those in trees are compactly woven out of sticks and weed stems and are lined with leafy twigs and grasses. Those on rocks are often raised on a foundation of seaweeds and trash and are sometimes wholly of such material. Feathers, green fir twigs, and all sorts of odd objects are incorporated in the lining. The 3 or 4 eggs (2.4 x 1.5) are pale blue with a chalky covering.

RANGE: (P. M.) Breeds from Newfoundland, n. Ontario, c. Saskatchewan, and the Alaska Peninsula south to the Bahamas, Isle of Pines, and s. Lower California. Winters along the seacoast from Long Island and s. Alaska and inland from Tennessee south to the West Indies and Panama.

Olivaceous Cormorant* *Phalacrocorax olivaceus*—~~18~~
(Mexican Cormorant) L. 25; W. 40; Wt. 3¾ lbs.

IDENTIFICATION: Its smaller, slimmer appearance is this bird's best field mark. Its black has a purplish rather than a greenish sheen, and when nesting it has a distinctive white line where the throat and gular sac meet. Young are brownish with pale to whitish under parts.

HABITS: The olivaceous cormorant is a zoneless bird, so tolerant of varying temperatures that it has no habitat requirements beyond water with some form of animal life in it to serve as food. From the humid heat of the equator to the cold stormy seas off Cape Horn and in icy Andean lakes, this species seems equally at home. It occurs on rocky, sandy, or muddy, marshy coasts and inland on rivers and mountain streams and lakes; it nests in deserts, tropical forests, and on coastal islands. One of its notable characteristics in many areas is its fearlessness and its readiness to accept man-made structures for nest sites. Bottom fish caught in rather shallow water seem to be its chief food.

VOICE: A frequently heard guttural, piglike grunt.

NEST: (A.) In colonies in trees, on rocks, or on the ground. The nests vary from substantial platforms of sticks to mounds composed of little more than seaweed. The 4 pale bluish eggs (2.1 x 1.3) are chalky and often nest-stained.

RANGE: (R.) Occurs from the Bahamas, Cuba, s. Louisiana, and n.w. Mexico south to Tierra del Fuego.

DARTERS**Family Anhingidae****Anhinga**

(Snake-bird; Water-turkey)

Anhinga anhinga—~~18~~

L. 34; W. 48

IDENTIFICATION: The long fanlike tail, very long snaky neck, and small head, held straight out in flight, are distinctive, as is the habit of alternately flapping and soaring. Often when the bird is in water only the head and neck are visible. When perched it sits upright and frequently holds its wings in a "spread-eagle" position like a cormorant.

HABITS: Small bodies of quiet or sluggishly flowing fresh water are the preferred feeding grounds of the snake-bird, which is generally common about the numerous channels and open ponds of extensive marshlands, where suitable clumps of willow or other trees are available for roosting. Fish and other aquatic life constitute the food supply. The anhinga is an excellent soarer and appears to engage in aerial play in which a group soars up so high that it almost disappears.

VOICE: All one commonly hears are harsh guttural grunts like those of cormorants. During courtship in spring soaring birds often emit a short series of hawklike whistles or squeals.

NEST: (A.) During the breeding season these birds are frequently associated with various herons, their nests being scattered through the trees among those of the other species. They do, however, nest in small groups by themselves or on the outskirts of a big rookery. The nests are bulky structures of sticks and dead leaves used year after year, generally with the addition of a lining of fresh green leaves and moss. The 4 pale blue chalky eggs (2.1 x 1.4) are soon stained brown.

RANGE: (P. M.) Breeds s. North Carolina, s. Missouri, s.c. Texas, n. Mexico south to s. Brazil and n. Argentina. Winters South Carolina, the Gulf States, and s. California south.

MAN-O'-WAR-BIRDS**Family Fregatidae****Magnificent Frigate-bird**

(Man-o'-war-bird)

Fregata magnificens—~~18~~

L. 40; W. 90; Wt. 3½ lbs.

IDENTIFICATION: The deeply forked tail and the extremely narrow wings, much longer than those of the swallow-tailed

kite, are diagnostic. Sexes are alike during the first year, when the head, neck, and under parts (except the underwing primaries) are largely pure white. Fully adult plumage, in which sexes are different, is not acquired until the end of the second year.

HABITS: This species is common along all tropical seacoasts, but it is not in any sense a pelagic bird and seldom goes far from land. For its weight it has the largest wings of any bird alive; it is able to rise and soar on the gentlest breeze and in the air is the very embodiment of speed and grace. In contrast with the wings, the feet and legs are so weak and small that it can hardly walk and must always take off from an elevated position. It is a sea bird and yet it never goes near the sea; its feathers do not shed water and it is not known that it can take off from water. It has wonderful eyesight and often detects its prey from aloft, after which it descends in a spectacular dive to catch it. It obtains much of its food by following feeding schools of albacores or other large predaceous fish and seizing their quarry as it leaps into the air to escape. Surface swimmers are lifted from the water with hardly a ripple, and flying fish are important in the diet. The stronger the wind and the more turbulent the air, the easier the fishing. On calm days the birds seem to depend more on robbing pelicans, cormorants, and other sea birds of their catches, using rough tactics when necessary. Since their preference is for rather large fish (up to 12 to 14 inches), smaller sea birds like terns are unmolested. All kinds of animal waste are scavenged from the water, and the birds often become quite tame and fearless. During the breeding season the male has a curious way of inflating the gular sac, which at this time is bright crimson instead of the usual pale orange.

VOICE: The only sounds are harsh gurgling notes during courtship.

NEST: (A.) These birds generally nest in colonies by themselves, but occasionally the nests are scattered among those of such birds as pelicans and cormorants. The usual site is on top of low vegetation or, at times, on the ground or in tall trees. The nest is a sparse, loosely built platform of sticks and twigs. The single egg (2.7 x 1.8) is white and thin-shelled.

RANGE: (R.) Breeds in the Bahamas, West Indies, and from Mexico south to n. South America, also to the Cape Verde and Galápagos Islands. Ranging regularly north to Florida and the whole Gulf Coast and south to c. South America.

HERONS and ALLIES

Order Ciconiiformes

Comparison of Average Length and Wingspread of Crane-like Birds

SPECIES	LENGTH	WINGSPREAD
Least Bittern	13	18
Green Heron	18	25
Scarlet Ibis	22	36
Glossy Ibis	22	38
White-faced Glossy Ibis	23	38
Snowy Egret	24	38
Little Blue Heron	24	41
Yellow-crowned Night Heron	24	44
White Ibis	25	40
Night Heron	25	44
Tricolored Heron	26	38
Limpkin	26	42
American Bittern	27	39
Reddish Egret	30	46
Roseate Spoonbill	33	52
Egret	39	55
Wood Ibis	41	65
Sandhill Crane	44	80
Great Blue Heron	46	70
American Flamingo	48	60
Great White Heron	49	75
Whooping Crane	50	90

HERONS and BITTERNS

Family Ardeidae

Great White Heron*

Ardea occidentalis—~~14~~
L. 49; W. 75

IDENTIFICATION: The large size and heavy appearance, together with the broad heavy bill—yellow to greenish at the tip—and

the yellow legs that are greenish in front, are distinctive, as are the elongated fore neck and crest feathers of breeding adults.

HABITS: This heron is almost entirely maritime in distribution, typical habitat being the shallow bays and mangrove-covered keys of Florida Bay and adjacent areas. It feeds along the channels among the flats, chiefly by waiting patiently for its prey to come within striking distance. Here it takes fish, shrimp, and probably anything else that comes within range. It seems at all times a slow, sedate bird and flies with a slow, powerful wingbeat. If it were not for its color, short head plumes, and slightly larger average size, this would be just another great blue heron. Many authorities consider it such, but this seems unlikely, as a typical large race of the latter occurs in the same area, and yet the two stay so well isolated in a reproductive sense that they seldom interbreed.

VOICE: A rough, rasping squawk or scold.

NEST: (A.) Small mangrove-covered keys are the usual nest site, and a single key may contain from 1 to a dozen nests. The nests are bulky, well-made platforms of large sticks, with a hollow in the center that is lined with finer materials, and are always placed in the tops of low trees. The 3 eggs (2.4 x 1.7) are pale blue-green.

RANGE: (R.) Occurs in Florida Bay and adjacent areas, the West Indies, and Yucatan.

Würdemann's Heron*

✕ 14

IDENTIFICATION: This bird is characterized by its pure-white head and crest, otherwise it looks very much like a great blue heron.

HABITS: Nothing specific is known about the habits of this heron that indicates a difference between it and the great white heron or the great blue heron.

RANGE: (R.) Seems to occur throughout the range of the great white heron.

COMMENT: All that is definitely known about these birds is that they occasionally occur in the same brood with pure-white birds and can have at least one white parent. Some ornithologists believe them to be hybrids between the great blue heron and the great white heron, but such a mating has never been authenticated in the field. Another difficulty is that in a cross of this type all offspring of the original cross generally look alike. It seems more reasonable, as has been sug-

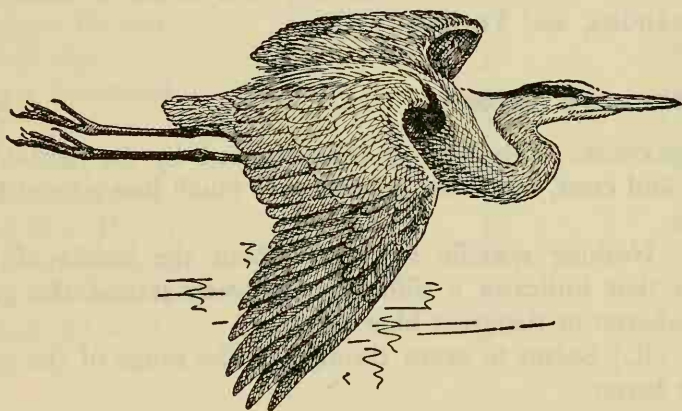
gested by Dr. Ernst Mayr, that the plumage we call Würdemann's is recessive in the great white heron population and crops out only when a bird happens by accident to receive the recessive Würdemann color genes from both parents.

Great Blue Heron*

Ardea herodias—~~14~~
L. 46; W. 70; Wt. 7 lbs.

IDENTIFICATION: The great size of this 4-foot-high heron, frequently called a blue crane, is absolutely distinctive. In flight it folds back its neck and rests its head on its shoulders in typical heron fashion (a true crane flies with its neck outstretched like a goose).

HABITS: (Age 15 yrs.) This fine big heron that adds such a picturesque touch to the landscape is a versatile and adaptable bird. It is at home on small streams, upland meadows, and even in crop fields, as well as on the shores of ponds and lakes. Marshes, salt and fresh, are much frequented, as are coastal mud flats, sand bars, and shallow bays. It fishes either by waiting patiently for its prey to come within range or by slowly walking through the shallow water. Occasionally a bird will drop down with outstretched wings on the surface of deeper water and feed as it floats. Wet meadows and pastures are common feeding grounds.



Although completely protected by the Federal Migratory Bird Treaty, no bird is in greater need of friends than the great blue heron. Its large size makes it an easy and tempting target for the thoughtless, and its nesting colonies are easily broken up by intruders. It eats a great many different kinds of small animal life from snakes, insects, mice, and frogs to fish, eels, salamanders, and an occasional rail or other

marsh bird. Many thorough researches into this heron's food habits have been made in various parts of the country. They all show that the bird takes very few adult game or food fish. Most of those that are taken are so small that their removal usually constitutes a desirable culling or weeding of a population of growing fish relatively few of which can hope to mature. The bulk of the great blue heron's fish diet is drawn from the ranks of the non-game species, many of which prey on game fish at some stage of their development and, what is far more serious, compete with them for the always very limited supplies of natural fish foods in the water.

The fine fishing so commonly encountered in the waters of wild, remote areas where wild fish eaters like this heron have never been disturbed and therefore still occur in normal numbers suggests that man would profit from a greater abundance of these species in settled areas. Here they are needed even more, as man's highly selective take of game species creates an unbalanced condition that the heron's fishing would tend to correct. Unfortunately the keen senses of these birds enable them quickly to detect the location of fish-hatchery pools crowded with small fish, where they can be very destructive unless the pools have been fenced and screened to exclude them. As this essential feature of a properly built fish hatchery is still lacking at many establishments, these potentially useful birds are still being lured in and destroyed, often by the hundreds, at hatcheries all over the country.

VOICE: In flight a drawn-out, harsh, gooselike *honk*; when startled, a hoarse, guttural squawk.

NEST: (I. 28, A.) These birds nest in colonies of from a few to many pairs, either by themselves or more frequently in association with other herons and water birds. They prefer an isolated patch of woodland or an island. Customarily they nest in the tops of the tallest trees, but they also use the tops of low shrubs or even nest on the ground. The flat nests are made of coarse sticks but are lined with finer materials and are usually placed well out on a tree limb. Many are over 3 feet in diameter and are repaired and used year after year. The 4 eggs (2.5 x 1.8) are pale green.

RANGE: (P. M.) Breeds from Nova Scotia, c. Quebec, n. Ontario, n. Alberta, and the Alaska Peninsula south to the West Indies, s. Mexico, and the Galápagos Islands. Winters from Massachusetts, s. Michigan, Wyoming, and Alaska south to n. South America and east to Bermuda.

Egret*

(Great White Heron B.O.U.)

Casmerodius albus—~~14~~ 14
L. 39; W. 55

IDENTIFICATION: The yellow bill, only slightly blackish at the tip (more extensively black in young birds), and the blackish legs are outstanding field characters.

HABITS: These tall, slim-necked herons frequent the borders of sluggish streams and ponds as well as salt- and fresh-water marshes. After feeding all day singly and in small groups they fly at sunset to large communal roosts which they share with other herons. The 40 to 50 long nuptial plumes that develop on the backs of both sexes during the breeding season are the "aigrettes" or "ospreys" of the millinery trade. Because of them the bird has been extirpated from many areas by plume hunters. In the United States it was reduced to rarity in the early 1900s and is still hunted for its plumes in many parts of the world. To obtain the "aigrettes" clean and fresh, the birds are usually shot when they have young, which means that the nestlings slowly starve to death. Public sentiment and the militant efforts of Audubon groups have suppressed the trade in the United States, and the birds are now common over most of their original range. Elsewhere they have not been so fortunate, as the plume trade that still thrives in the Latin countries, provides a tempting market for their plumage. Their food includes all types of aquatic animal life and rice farmers consider them valuable allies because of their heavy consumption of crayfish. They take a great number of frogs and snakes as well as fish.

VOICE: A deep, hoarse, rattlelike croak is its only note.

NEST: (I. 23, A.) This egret usually nests in swamp woods or willow thickets near water in a mixed rookery with other herons and such birds as cormorants and anhingas. Where possible the nests are placed well up (at least 20 to 40 feet) in large trees, but at times they may be quite low, especially if over water. The nest is a rather small, loosely made platform of sticks, often quite flat, with little or no lining. The 3 or 4 eggs (2.2 x 1.6) are a pale blue-green.

RANGE: (P. M.) Occurs on every continent in the world. In North America breeds from c. New Jersey, n. Ohio, s. Wisconsin, Utah, and Oregon south. It wanders north after the breeding season, in greater numbers some years than others, as far as Nova Scotia, s. Ontario, s. Manitoba, and Washington. Winters from South Carolina, s. Louisiana, and c. California south.

Snowy Egret*

(Snowy Heron)

Leucophoyx thula—~~14~~

L. 24; W. 38; Wt. 12 oz.

IDENTIFICATION: The bright yellow feet, contrasting sharply with the black legs, are distinctive. The backs of the legs of the young are greenish-yellow, and the feet are often not so bright a yellow, but the narrow bill is a uniform black at all ages.

HABITS: In full nuptial plumage this well-proportioned bird has a delicate, ethereal quality that makes it unquestionably the most beautiful of our herons. Its lovely recurved back plumes are the milliners' "cross aigrettes," and it probably came even closer to extirpation in this country than its larger relative. Fortunately, it has now gone a long way toward recovering its former abundance and reoccupying its original range. When feeding it is the most active of all our herons, constantly stirring the bottom ahead of it with a quick vibration of its foot and running here and there in active pursuit of its prey, often with partly raised wings. The shallow water of marshes and ponds and wet meadows and fields are favorite feeding grounds. Salt bays and salt marches are very attractive, and snowies are generally abundant in such places, occasionally feeding on the open beaches. Crustacea—like shrimp, crabs, and crayfish—and insects are important in their diet along with frogs, fish, and other small aquatic life.

VOICE: Although generally quite silent, this heron can utter a most unpleasant, harsh, grating scold or hiss.

NEST: (I. 18, A., N. 23) These birds nest in mixed colonies with other small herons and ibis near or over water. Nests may be 6 to 12 feet up in trees or shrubs but are often only a foot or two above the water in matted marsh vegetation. The structure is a frail, sparse platform of sticks lined with finer material. The 4 or 5 eggs (1.7 x 1.3) are pale blue-green.

RANGE: (P. M.) Breeds from Long Island, s. Missouri, Utah, and c. California south to Chile and n. Argentina. Occasionally wanders north as far as s. Canada in late summer. Winters from South Carolina, the Gulf Coast, and California south.

Reddish Egret**Dichromanassa rufescens*—~~14~~

L. 30; W. 46

IDENTIFICATION: The heavy, black-tipped, flesh-colored bill, the bluish legs, and the rough, shaggy appearance of the neck

are distinctive in adults in either of their 2 color phases. Dark-phase young are often almost wholly gray, showing only a little reddish color on the throat and forewing. In both phases the young have uniformly dark grayish-black bills and greenish-black legs.

HABITS: This heron, like the reef heron of the Southwest Pacific, occurs in 2 distinct color phases—one bluish-slate with a rufous-chestnut neck, the other pure white—that bear no relation to the individual's age or sex. The white is the rarer phase, varying geographically from 1 in several hundred to almost 50-50 in some areas. The species is largely a salt-water heron which feeds in the shallow water of coastal bays and on the open beaches.

The accessibility of its island nesting colonies spelled its doom in the plume-hunting days, and it was almost extirpated from our coasts. In Texas, under Audubon warden protection, it has recovered its abundance, but it has only begun to return to s. Florida. The rookeries in which these birds nest seem to be especially vulnerable to the depredations of such egg eaters as boat-tailed grackles and fish crows and occasionally black vultures, which also take young birds. For this reason these colonies should never be visited early in the breeding season, as these predators can do tremendous damage if the herons are kept away from their nests. Nothing specific seems to be known about food preferences, if any, but the birds are conspicuously active when feeding, rushing here and there and maintaining little of the grace and dignity commonly associated with herons.

VOICE: A guttural squawk, somewhat less harsh than that of most herons.

NEST: In colonies with other herons, spoonbills, and cormorants, usually on coastal islands. The well-made nests of sticks and twigs with a lining of finer material are generally placed in the tops of low shrubs, or trees, anywhere from a few to 10 or 15 feet high, but sometimes they are on the ground. The 3 or 4 eggs (2.0 x 1.5) are pale bluish-green.

RANGE: (P. M.) Occurs from s. Florida, the Gulf Coast, and Lower California south to Hispaniola, Jamaica, and Yucatan.

Tricolored Heron*
(Louisiana Heron)

Hydranassa tricolor—~~15~~
L. 26; W. 38

IDENTIFICATION: This heron has a long, almost snakelike neck and a long bill, but its most noticeable characteristics in any

plumage are its white under parts and rump. The black-tipped bill varies seasonably from purplish-blue to yellowish and the legs from slate to yellowish-green.

HABITS: (Age 17 yrs.) Today this is probably the most abundant of southern herons. Like the snowy egret, it is a characteristic bird of the vast marshes near the coast, occurring inland only in regions of extensive open marshland. When feeding it usually keeps on the move, crouching or freezing momentarily before darting out unerringly with its long bill. Killifish, minnows, and other small shallow-water fish are probably its chief food, but it takes shrimp and crayfish and in some areas many grasshoppers and other insects.

VOICE: A variety of hoarse, guttural, but not especially loud notes.

NEST: (I. 21, A.) In small colonies by themselves or in large densely crowded ones which they share with other species. Usually nests are in thickets of low trees or shrubs, but occasionally they are in matted canes or other dense vegetation. In trees they may be 10 to 15 feet high, at other times almost on the ground. As a rule they are well-made structures of sticks and twigs, carefully lined with finer materials. The 4 or 5 eggs (1.7 x 1.3) are pale blue-green.

RANGE: (P. M.) Breeds from s. New Jersey, the Gulf States, and Lower California south through the West Indies to n.e. Brazil and n.w. Ecuador. Wanders north of its breeding grounds only rarely and winters from South Carolina, the Gulf Coast, and s. California south.

Little Blue Heron*

Florida caerulea—~~14~~
L. 24; W. 41

IDENTIFICATION: The uniformly dark body and maroon head and neck of adults, together with their heavy black-tipped bluish bills and dark legs, are distinctive. Young are white, but the broad-based bicolored bill and the uniformly dull greenish feet and legs are very different from those of the snowy egret. Molting young present a curious pied appearance.

HABITS: In inland fresh-water marshes of the South this is generally the commonest heron, but at times it also occurs in considerable numbers in coastal marshes, where it associates with tricolored herons and snowy egrets. After the breeding season it wanders north in greater numbers than any other southern heron except the egret. Most individuals encoun-

tered in the North are the pure-white young of the year; as a result they are often mistaken for egrets or snowy egrets. The little blue is a fairly active feeder in shallow water and on marshlands and upland meadows and seems to take a higher proportion of crayfish, frogs, and insects and fewer fish than most herons. At sunset the birds stream in from their feeding grounds to large communal roosts. It is quite a sight to watch the flocks come in high in the air, then suddenly break as birds descend almost vertically by means of a rapid series of "side slips."

VOICE: When alarmed, a hoarse croak; when quarreling, harsh parrotlike screams.

NEST: (A.) In small groups or large colonies with other herons. Usually in a dense clump of willows or bushes, but larger swamp trees, generally those standing in water, are also used. The normal height is 3 to 8 feet, but they go up to 40 feet above water. The 4 or 5 pale blue-green eggs (1.7 x 1.3) are laid in a typical loose, frail heron nest with little or no lining or hollow for the eggs.

RANGE: (P. M.) Breeds from s. New Jersey, s. Missouri, c. Texas, and c.w. Mexico south through the West Indies to c. Argentina and Peru. Wanders north in summer to Nova Scotia, s. Ontario, Wisconsin, Nebraska, and s. Lower California. Winters from North Carolina and the Gulf Coast south.

Green Heron*

Butorides virescens—~~15~~ 15
L. 18; W. 25

IDENTIFICATION: This small dark bird does not look much like a heron as it stands at the water's edge with its neck drawn in. Its short legs are a fairly bright greenish-yellow, those of the male turning orange-red in the breeding season.

HABITS: This is the most widely distributed of all our herons. Usually every brook and pond has a pair, and it is common in any extensive marsh, whether fresh or salt. When stalking its prey it often freezes in odd positions and holds them with great patience. When disturbed it stretches out its neck, erects its rough crest, and nervously jets its short tail. When flushed it flies only a short distance with head and neck extended while it utters sharp squawks of alarm. Small fish, such as killifish, minnows, gobies, and silversides, are the commonest food, but quantities of crayfish and aquatic and terrestrial insects, like grasshoppers, are also taken.

VOICE: The most common note is a distinctive, harsh, penetrating *kyow*. The bird also has a number of low clucking and grunting notes.

NEST: (I. 17, A.) Although commonly a solitary nester, this species may nest in colonies up to 30 pairs or occasionally with other herons or grackles. A dense-foliaged tree, often evergreen, is a favorite site, with the nest 15 to 20 feet up. Low shrubs or marsh hummocks may be used, but the site need not be near water. The frail nest is an unlined, rather small, flat platform of loose sticks. The 4 or 5 eggs (1.5 x 1.2) are pale glaucous green.

RANGE: (P. M.) Breeds from Nova Scotia, s. Ontario, North Dakota, and Oregon south throughout the West Indies and to the Canal Zone. Winters from South Carolina, s. Texas, and s. California south.

Night Heron*

Nycticorax nycticorax—~~15~~
L. 25; W. 44

(Black-crowned Night-heron)

IDENTIFICATION: The stocky build and predominantly pale gray and white color of adults are distinctive, as is the uniformly gray-brown color of the white-spotted young. Both neck and bill are short and heavy for a heron, and the bird generally sits with its neck contracted, which gives it a hunched-up look. The short legs are normally dull yellow but turn quite red at the height of the breeding season.

HABITS: (Age 15 yrs.) These night herons commonly sleep all day in a treetop roost and stream out at sunset to their feeding grounds, flying with steady deep beats of their heavy broad wings. A few feed by day, especially in dull weather. They are commonest in areas with extensive marshes, either fresh or salt, but after the breeding season they wander widely and may be found on almost any small lake or pond. This is a relatively fearless species, seemingly less bothered by the proximity of civilization than any other heron. There are nesting colonies in or near some of our largest cities. In the North these colonies are always good places to look for the occasional nesting of some of the rarer southern herons and for the great horned owls that begin nesting before the herons and later on are not above feeding nestling herons to their young. The black-crowned eats a variety of animals and is a good enough mouser to subsist on rodents for short periods during the winter when all open water freezes over. Ordinarily fish, chiefly non-game types, make up about half its

diet, with crayfish and other crustacea, aquatic insects, and frogs constituting the rest.

VOICE: In flight the birds utter a characteristic *quock* or *woc* that readily identifies them as they fly over at night. In the breeding colony a variety of other guttural or shrill squawks are heard.

NEST: (I. 25, A.) Always in crowded colonies and, in the South, usually with other herons. The site is in a dense grove of young trees near water, when available, the nests being at moderate heights (20 to 30 feet). This is an adaptable species and will nest far from water in tall trees or practically on the ground in matted reeds or grass. On occasions it builds a floating nest. Nests vary from fragile to bulky, well-built structures made of sticks and twigs with a heavy lining of finer material. The 3 to 5 eggs (2.0 x 1.5) are varying shades of pale blue-green.

RANGE: (P. M.) Occurs over much of Europe, Asia, and Africa and the whole Western Hemisphere, where it breeds from Nova Scotia, s. Quebec, n. Manitoba, and n. Oregon south to Tierra del Fuego. Winters from Massachusetts, s. Illinois, Utah, and n. California south.

Yellow-crowned Night Heron

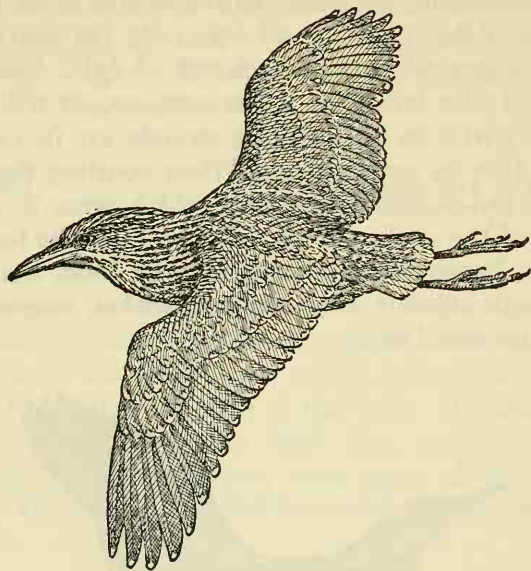
Nyctanassa violacea—~~15~~
L. 24; W. 44

IDENTIFICATION: The strongly marked head and the uniformly gray body of adults are distinctive. Young are darker and not as brown as the night heron and are speckled rather than spotted. This species has a heavier bill and longer, yellower legs which, when the bird is seen in silhouette against the sky, are its best field character, since they project well beyond the tail while the night heron's do not.

HABITS: This bird is far from strictly nocturnal and often seems as active by day as any heron. With its slender neck and big head, which it generally holds high, it is very different in appearance from the night heron, which contracts its neck both in flight and on the ground. The key to understanding this bird's habits lies in its strong preference for crustacea—crayfish and aquatic insects in fresh water and fiddler and other crabs in salt water. Its occasional occurrence in dry uplands can probably be accounted for by its taste for mice and other small mammals, insects, and land crabs. Frogs, salamanders, snakes, and some fish enter into its diet at times.

Swamp forests of cypress, gum, willow, and other moisture-loving trees and the mangrove swamps of the Florida coast are favorite haunts of these herons.

VOICE: The common call is a short *woc* or *vac*, pleasanter than a night heron's and not so harsh and guttural.



NEST: (A.) These birds usually nest in small groups of 2 to 6 pairs, large colonies being quite rare. They are often attracted to the vicinity of big rookeries of other herons but generally nest by themselves on the outskirts. The nest site may be high up in a cypress tree or in a low tree or shrub or, in some cases, on the ground. The nest is generally a thick, bulky structure of sticks with a substantial lining of finer material. The 3 or 4 eggs (2.0 x 1.5) are pale blue-green.

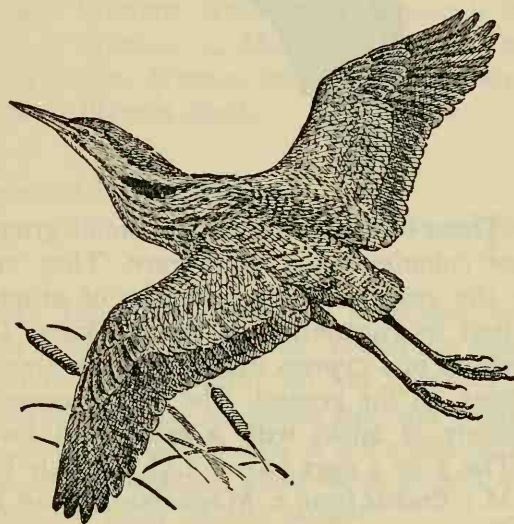
RANGE: (P. M.) Breeds from e. Massachusetts and Long Island, Indiana, Kansas, s. Texas, and Lower California south through the West Indies and Mexico to s. Brazil and Peru. Winters from c. Florida, the Gulf Coast, and Lower California south.

American Bittern*

Botaurus lentiginosus—~~15~~ 15
L. 27; W. 39

IDENTIFICATION: The dark slate-gray outer wing, contrasting with the rich brown of the body and inner wing, and the black stripe down the side of the neck are good field marks. Young differ only in being lighter brown.

HABITS: Marshes, bogs, and wet meadows, salt or fresh, are the home of the American bittern. It seldom leaves the protection afforded by dense beds of cattails or other rank growths and never alights except on the ground. It clings so closely to concealment that one seldom sees it except as a large brown bird that suddenly flushes up with a hoarse croak from almost underfoot. After flapping off low over the marsh for some distance it generally drops back out of sight. Should you see it before it flies but after it has seen you, it will freeze into immobility with its bill pointing straight up, its streaked body blending into its surroundings. When courting the bird erects a pair of fan-shaped white ruffs which seem to spring from the base of the neck and are held up over the back near the shoulders. Frogs seem to be its favorite food, but it takes all small marsh animals, from mice to snakes, crayfish, shellfish, insects, and small fish.



VOICE: Many of the bittern's common names—"stake driver," "thunder pumper," and "dunk-a-doo"—derive from the curious sound it makes, chiefly in spring but to some extent at other seasons. This can best be described as a deep, hollow, rather guttural croaking which the bird makes by gulping in air until its crop is distended; the air is emitted in groups of 3 well-accented syllables, like *pup-er-lunk*, repeated 5 or 6 times; the call carries well and can often be heard half a mile or more, the sharp middle note rising above the others.

NEST: (I. 28, A., N. 14) Usually in a marsh or on the edge of

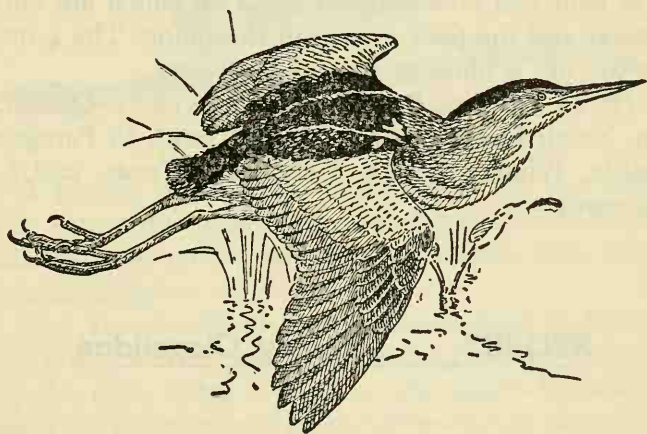
a wet meadow in a dense growth of tall cattails, grasses, or sedges. The nest itself is a platform of dead plant stems and leaves built up a few inches above the water. The 4 or 5 eggs (1.9 x 1.4) vary from buffy-brown to olive-buff.

RANGE: (P. M.) Breeds from Newfoundland, n. Quebec, s. Mackenzie, and c. British Columbia south to s. New Jersey, the Ohio Valley, Kansas, c. Arizona, and s. California. Winters from Virginia, Illinois, s. Texas, and British Columbia south to Cuba and Panama.

Least Bittern

Ixobrychus exilis—~~15~~ 15
L. 13; W. 18

IDENTIFICATION: This, our smallest heron, displays a bold, distinctive pattern in flight. The inner wing is buffy-yellow forward and rich chestnut behind, and the outer wing is slaty. Upper parts in the male are a glossy greenish-black with a fine white line down the side of the back. Females are dark purplish-brown with a buffy back line, and they and the young (which have a lighter, even more distinctly brown back) have the pale throat and fore neck finely streaked with dark brown.



HABITS: Almost every extensive fresh-water marsh with dense stands of cattails or other reedlike plants generally harbors a few of these elusive little herons. In the South they also occur in salt marshes. Ordinarily they are not colonial in nesting habits, though, like the green heron, they are sometimes attracted to the vicinity of boat-tailed grackle colonies. In behavior and action they are more like rails than herons.

They prefer to escape by running rather than by flying, and they flush with dangling legs just over the vegetation and quickly drop down again out of sight. At times they conceal themselves by freezing with feathers compressed and bill pointed skyward. When the water is too deep for wading they travel through the marsh by clinging to plant stems, a process which does not seem to slow them up appreciably. The many large insects that occur in aquatic habitats are an important food, but small fish and other small animal life of the marsh contribute to their diet.

A melanistic color phase goes by the name of Cory's least bittern. In it the browns are darkened to rufous-chestnut. This phase is rare, and such birds are worthy of close study to detect possible differences in nesting or other behavior.

VOICE: A series of 4 or 5 low, hollow cooing notes that have been likened to those of a coot or gallinule, a cuckoo, dove, frog, or pied-billed grebe. It also utters a harsh cackle when disturbed.

NEST: (I. 17, A.) Usually in a dense clump of cattails, saw grass, or other marsh vegetation growing in a foot or more of water, occasionally in a shrub. The small, flimsy nest is 1 to 3 feet above the water and is generally supported by a mass of bent and broken-down stalks on which are laid twigs and stalks and the finer grasses of the lining. The 4 or 5 eggs (1.2 x .9) are a blue- or green-white.

RANGE: (P. M.) Breeds from New Brunswick, s. Quebec, Wisconsin, North Dakota, and s. Oregon south to Paraguay and Colombia. Winters from s. Georgia, s. Texas, and s. California south.

STORKS

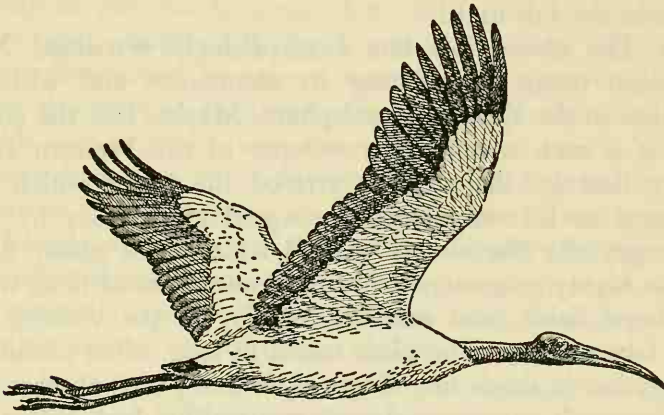
Family Ciconiidae

Wood Ibis*
(Wood Stork)

Mycteria americana—~~17~~
L. 41; W. 65; Wt. 11 lbs.

IDENTIFICATION: This stork differs from any other large white bird in having a black tail and the whole rear part of the outstretched wing black clear to the body. Young birds lack the bare, scaly head and neck of an old "flinthead," and the body plumage is not such a pure white. Unlike a heron, this bird carries its neck and legs fully outstretched in flight.

HABITS: Low, wet country where vast swamps alternate with open marshy meadows and shallow muddy ponds are the home of this gregarious bird—our only native stork. Along the coast flocks feed on the flats and in the shallow water left when the tide is out. When feeding, the wood ibis walks about actively and appears to take every kind of animal life found in shallow water—tadpoles, fish, snakes, insects, etc. After feeding, members of a flock are apt to assemble in the top of a dead tree to sun and to digest their meal, but if the air currents are right, they may soar instead. Circling to stay in a rising column of warm air or thermal, they may go up almost out of sight, frequently only to dive down and repeat the procedure.



VOICE: A hoarse croak when disturbed is all one hears from adults. A nesting colony full of young produces a bedlam of grunts, squeals, and a dozen other sounds that carry for a surprising distance.

NEST: (A.) In colonies of from 20 to 30 pairs to thousands of pairs. The preferred site seems to be a stand of giant swamp trees, the nests being placed in the upper branches. Small colonies are often located in islandlike clumps of such shallow-water trees as mangrove and willow. The nest is a bulky, flat platform of sticks lined with moss. The 3 eggs (2.7 x 1.8) are dull white.

RANGE: (R.) Breeds and winters to some extent from South Carolina, the Gulf Coast, and the Gulf of California south to Argentina and Peru. Wanders north in late summer to North Carolina, s. Illinois, n. Texas, Arizona, and s. California, with occasional stragglers farther north.

IBISES and SPOONBILLS Family Threskiornithidae**Glossy Ibis***

Plegadis falcinellus—~~16~~ 16
L. 22; W. 38

IDENTIFICATION: At a distance this bird looks black. Its legs are grayish- or greenish-black, and the bare skin of its face at the base of the bill varies from slaty-blue to white (at the height of the breeding season). In winter the head and neck are a duller brownish-black streaked with white. The downy young are dull black with a white crown patch. The juvenile plumage is dull gray-brown below and rich metallic green above, the head and neck becoming streaked like winter adults in the fall molt.

HABITS: The glossy ibis has a surprisingly restricted North American range, considering its abundance and wide distribution in the Eastern Hemisphere. Maybe, like the cormorant, it is such a relative newcomer to the Western Hemisphere that by the time it arrived the niche which it is equipped to fill was already occupied to capacity by other ibis, especially the closely related white-faced glossy ibis.

This highly gregarious ibis is at home on mud flats, wet or inundated fields, and marshes, usually in the vicinity of a large lake or river. The birds travel in long, often undulating lines, either in single file, diagonal, or every bird abreast of its neighbor with outstretched neck and trailing legs. When only a few are present they associate freely with white ibis and join their long lines in flight; but when they are abundant, as around Lake Okeechobee, Florida, they keep to themselves except when feeding and have their own night roosts and nesting colonies. Crayfish, grasshoppers, small snakes, insect grubs, and leeches are among their staple foods.

VOICE: The common call is a grunting sound followed by 4 bleating notes.

NEST: (I. 21, A.) In low trees, shrubs, or beds of reeds growing in water, either in small groups in colonies of other ibis and herons or in large colonies by themselves. The nest is a flat, loosely made platform of sticks placed from a few to 10 or more feet above the water. The 3 or 4 eggs (2.0 x 1.5) are pale blue-green.

RANGE: (R.) Widely distributed in the Eastern Hemisphere from s. Europe south through most of Africa and east through s. Asia and the Indies to Australia. Occurs in the Western

Hemisphere only in Florida and the Gulf Coast to Mexico, Cuba, and Hispaniola. A few wander north erratically from time to time as far as s. Canada and Colorado, and it has bred in North and South Carolina.

White-faced Glossy Ibis*

Plegadis mexicana—~~16~~
L. 23; W. 38

IDENTIFICATION: The white feathers that border the bare skin on the face at the base of the bill are the chief field characters for this bird. The bare area is reddish, as are the legs and bill tip. Young do not differ enough from those of the glossy ibis to be distinguishable in the field.

HABITS: Drainage and reclamation projects have destroyed many of the marsh areas where these ibis were once abundant and, despite full legal protection from hunting, they have diminished in recent years. As they are willing to fly long distances to feed and seem to find plenty to eat in wet fields and irrigated land, the restoration of even a small tule marsh here and there for breeding would probably greatly increase their numbers. Crayfish, earthworms, and many kinds of insects are their chief foods. Occasionally this ibis is found breeding along the coast and feeding in tidal areas, although it generally seems to prefer fresh-water marshes and the shallow open water of inland sloughs.

VOICE: A croaking or grunting note, at times almost piglike.

NEST: (I. 22, A.) In colonies by themselves or in small groups in a heron colony. The site is usually a dense bed of tules or reeds growing in water. The nest is a large well-formed cup made of old reeds and lined with grass and placed on a mat of floating vegetation or supported several feet above water in old or new growth. The 3 or 4 eggs (2.0 x 1.5) are pale blue-green.

RANGE: (P. M.) Breeds from s. Louisiana, n. Utah, and Oregon south to s. Mexico; also from Peru and Brazil south to Argentina and Chile. After the breeding season it wanders (young birds usually) north as far as Minnesota (where it once bred) and s. British Columbia.

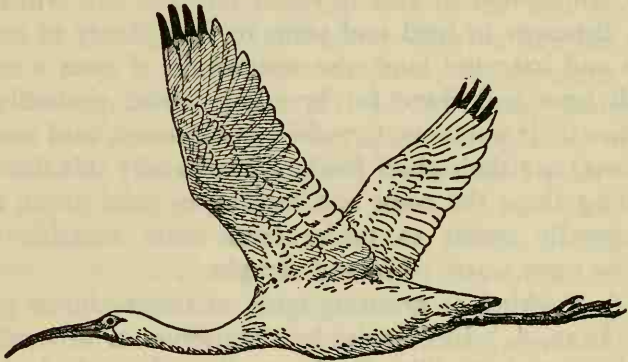
White Ibis*

Guara alba—~~16~~
L. 25; W. 40

IDENTIFICATION: This ibis shows only a little black on the ends of the 4 outer primaries. Young are white only on the under parts, lower back, and upper tail coverts—the wings being

a uniform dark brown. The soft parts vary from dull flesh color in winter to brilliant red during the breeding season.

HABITS: White ibis, thanks to the vigilant protection afforded them in their main Florida rookeries by Audubon wardens, still occur in great numbers. Rookeries of more than half a million birds have been reported in several recent years. Their flocks are a wonderful sight as they wheel high in the air in perfect unison. At a distance they seem alternately to shine out as a cloud of shimmering silver and as suddenly to disappear completely as they bank the other way. Small flocks heading out to feeding grounds or returning to the large roosts in which they spend the night during the non-breeding season travel in single file in long lines close to the marsh, each bird repeating any maneuver executed by the one in front of it.



The quantities of food required by a large colony are so great that the birds must have extensive feeding grounds and must be able to range out for long distances. Drought or other abnormal conditions often necessitate a shifting of the colonies from year to year, and occasionally a sudden failure of the food supply causes the abandonment of a rookery in mid-season. This species is also very sensitive to human disturbance, and rookeries have been abandoned following one or two visits by bird students. The shallow water of marshy areas, wet fields, and tidal flats are favorite feeding grounds. Here they find crayfish, fiddler crabs, snakes, and many kinds of insects.

The fertilizing effect of great rookeries and roosts of ibis and other water birds on nearby lakes and coastal waters, though enormous, is not yet generally appreciated by those most concerned—the local fishermen. Restoration of the bird

colonies in Tampa Bay from a population of a few thousand to some 215,000 birds coincided with the recovery of a virtually exhausted crab and mullet fishery that is today worth well over \$100,000 annually.

VOICE: On the breeding grounds one hears soft grunting sounds and sometimes hoarse howling notes, but the birds are generally rather quiet.

NEST: (I. 21, A.) These birds nest in dense colonies with herons and other water birds. The site is an area of low trees or shrubs standing in water. The nests vary from small to fairly large and are poorly made of sticks and moss with a lining of leaves. They are generally placed rather low, from 3 to 4 to 15 feet above the water. The 4 eggs (2.3 x 1.5) are greenish- or creamy-white with brown markings.

RANGE: (P. M.) Breeds from South Carolina, s. Louisiana, c. Mexico, and s. Lower California through the Greater Antilles to Venezuela and Peru. Winters from Florida and the Gulf Coast southward.

Scarlet Ibis*

Guara rubra—~~16~~
L. 22; W. 36

IDENTIFICATION: Adults are a solid and uniform scarlet except for the black ends of the 4 outer primaries. Young are dull grayish-brown with white under parts and are virtually indistinguishable from young white ibis.

HABITS: The scarlet ibis seems to be a more coastal bird than the white. It does much of its feeding on mud flats and shallow bays, taking crustacea, mollusks, and fish. Many more may come to our shores than we realize, as young birds—the great wanderers in any species—are not likely to be separated from young white ibis. Early writers lead us to believe that the scarlet ibis may have occurred regularly at one time in s. Florida. These beautiful birds would be a great asset to the Everglades if they could ever be established again in this seemingly ideal habitat.

VOICE: Silent except about its nesting colonies, where it makes a variety of grunting, hissing, and gurgling sounds.

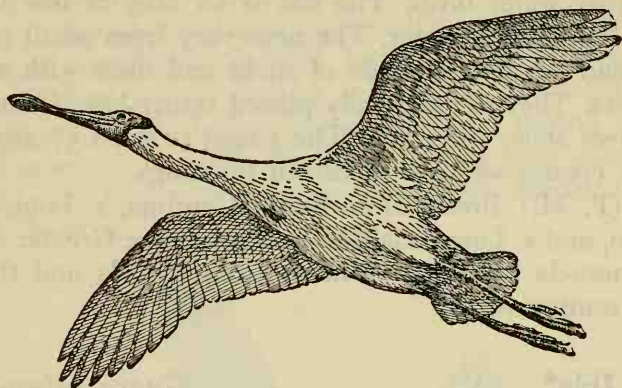
NEST: (I. 24, A.) These birds usually nest on dense brush- and mangrove-covered islands near river mouths. The normal clutch is 2 eggs, very similar to those of the white ibis.

RANGE: (R.) Occurs in northern South America from Venezuela to eastern Brazil. Accidental in the West Indies and on the shores of the Gulf of Mexico.

Roseate Spoonbill*

Ajaia ajaja—~~16~~
L. 33; W. 52; Wt. 3½ lbs.

IDENTIFICATION: The adults, with their wholly pink wings and outstretched heads, are very distinctive in flight. Young are at first entirely white except for a touch of pink under the wings and on the tail. They become increasingly pink with age and are fully adult when 3 years old.



HABITS: The roseate spoonbill, the only pink member of its family and the only spoonbill of the Western Hemisphere, frequents areas of shallow water both along the coast and inland along rivers, ponds, and marsh lagoons. It obtains its food, which consists of small fish, shrimp and other crustacea, and aquatic insects, by opening and closing its broad spatulate bill as it works it sideways in long arcs through the soft mud. Gregarious at all seasons, the birds feed in small flocks and join other water birds in large communal night roosts.

Once abundant up both sides of the Florida peninsula and the Texas coast, this magnificent bird had become virtually extinct in the United States by 1920. Since then, under Audubon protection, it has made some recovery in Texas, but only a few dozen pairs still breed in Florida. How stupid we were not to have encouraged from the first the greatest possible numbers of large birds like these that add so much color and beauty to our landscape at no cost save that of being left alone!

VOICE: Low clucking and grunting sounds about their rookeries are the only notes of this very silent bird.

NEST: (I. 23, A.) In dense rookeries with ibis, herons, and other water birds, usually on an island. The large, well-built stick nests are lined with leaves and bark and placed from

5 to 15 feet up in dense low tree or shrub growth. The 3 eggs (2.6 x 1.7) are dull white, well covered with brown markings.
RANGE: (P. M.) Breeds from s. Florida, s. Louisiana, the Texas coast, and n.w. Mexico south through the Bahamas, and from the West Indies and most of South America to n. Argentina and n. Chile. Flocks of non-breeding birds in their second year wander north to c. Florida and other points on the Gulf Coast.

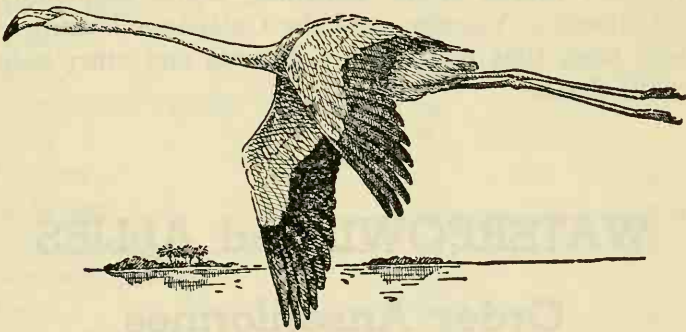
FLAMINGOS

Family Phoenicopteridae

American Flamingo* (Roseate Flamingo)

Phoenicopterus ruber—~~17~~
L. 48; W. 60; Wt. 7 lbs.

IDENTIFICATION: In the air these great birds fly with legs and neck fully extended and reveal their black flight feathers. These feathers are also largely black in the grayish-brown young birds that show only a tinge of pink on their under parts, tail, and wings.



HABITS: Once fairly abundant in s. Florida, though not known ever to have bred there, this species now occurs in the area only as a rare straggler. Inhabiting the vast open mud flats of shallow bays and lagoons, gregarious and very vigilant, flamingos are hard to approach if they can fly. However, like ducks and geese, the adults molt all their flight feathers simultaneously and are grounded for several weeks in summer. This makes them temporarily almost as vulnerable to hunters as the much-prized tender young birds that leave the nest 3 or 4 days after they hatch.

To date there is no assurance that this species, one of the most striking birds in the world, will not follow the passenger pigeon and the great auk into oblivion, and in the not too distant future. One of the important foods of the flamingo in the Florida-Bahama area is the snail-like cerithium mollusks, which are swallowed whole and crushed in the bird's very powerfully muscled stomach. As these animals are so abundant as to nearly pave the bottom along part of the s.w. Florida coast, it seems as though a real effort should be made to restore the flamingo to our avifauna before it is too late.

VOICE: These noisy birds have several loud, gooselike, honking notes, the commonest a *huh-huh-huh* call with the middle note strongly accented. The honks vary in pitch and are supplemented by a henlike cackle.

NEST: (I. 31, P.) Flamingos nest in dense colonies of from several hundreds to thousands on open mud or marl flats that are wet enough to provide mud for their nests. The nests are low, cylindrical mounds varying from an inch or two to a foot in height; they are hollowed out to hold the single rough, chalky-white egg (3.6 x 2.2). The birds seem unable to nest successfully in any area that can be reached by mammalian egg predators.

RANGE: (R.) Breeds in the Bahamas, Cuba, Hispaniola, n.e. South America, Yucatan, and the Galápagos Islands. A few wander from time to time to s. Florida and other points on the Gulf Coast.

WATERFOWL and ALLIES

Order Anseriformes

Comparison of Average Length and Wingspread of Birds Usually Seen on the Water

SPECIES	LENGTH	WINGSPREAD
Dovekie	8	—
Least Grebe	9	—
Puffin	12½	—

SPECIES	LENGTH	WINGSPREAD
Pied-billed Grebe	13	—
Horned Grebe	13	—
Eared Grebe	13	—
Black Guillemot	13	—
Masked Duck	13½	20
Bufflehead	14	22½
Teal	14	23
Green-winged Teal	14	23
Ruddy Duck	15	22½
Blue-winged Teal	15½	24
Cinnamon Teal	15¾	24½
Oldsquaw (female)	16	28½
Murre	16½	30
Harlequin Duck	16¾	25
Razor-billed Auk	17	26
Ring-necked Duck	17	27
Hooded Merganser	17½	25
Lesser Scaup Duck	17½	27½
Scaup Duck	17¾	30½
Thick-billed Murre	18	—
Wood Duck	18	24
Barrow's Goldeneye	18	28½
Goldeneye	18	28½
Widgeon	18½	31
White-cheeked Pintail	19	—
Shoveler	19	31
Surf Scoter	19	32
Black Scoter	19	32½
Fulvous Tree Duck	19	36
Red-necked Grebe	19½	—
Redhead	19½	32
American Widgeon	19½	32½
Gadwall	20	34
Oldsquaw (male)	21	28½
Mottled Duck	21	—
Canvasback	21	33
Black-bellied Tree Duck	21	37
White-winged Scoter	21	37½
Pintail (female)	21½	34
Red-breasted Merganser	22	32
King Eider	22	36
Canada Goose (small)	22	43½

SPECIES	LENGTH	WINGSPREAD
Mallard	22½	36
Black Duck	23	36
Brant	24	45
Arctic Loon	24	—
Merganser	24	36
Eider	24	41
Ross' Goose	24	50
Red-throated Loon	25	—
Olivaceous Cormorant	25	40
Barnacle Goose	25	52
Western Grebe	26	—
Pintail (male)	27	34
Blue Goose	27½	54
Snow Goose	29	58
White-fronted Goose	29	58
Common Loon	29	—
Double-crested Cormorant	32	51
Anhinga	34	48
Yellow-billed Loon	35	—
Cormorant	36	61
Canada Goose (large)	39½	76
Brown Pelican	50	80
Whistling Swan	52	83
Mute Swan	58	—
White Pelican	60	100
Trumpeter Swan	65	100

WATERFOWL**Family Anatidae****Mute Swan***

Cygnus olor—♂3
L. 58; Wt. 27

IDENTIFICATION: The pinkish-orange bill and the black knob on the forehead—larger on the cob (male) than on the pen (female)—are distinctive. At a distance the sweeping curve of the neck, the downward tilt of the bill, and the habit of arching the secondaries over the back (the attitude of aggression) are good field characters. The brownish young have a dusky-pink bill, dark at the base, with only a suggestion of a knob.

HABITS: The shallow, well-sheltered bays of Long Island and New Jersey and the many ponds that have been created by damming the heads of marsh creeks are apparently ideal habitats. Captivity seems to have had no effect on the ability of subsequent generations to return to the wild state, and a thriving and steadily growing population seems to be well established. These swans generally prefer to nest in fresh water, but with freezing weather they migrate to nearby salt water that remains open all winter. They feed exclusively on underwater vegetation, tipping up like ducks, but with their long necks reaching greater depths than those of any dabbling duck or goose. As a result, swans generally do not compete seriously with ducks but instead often make food available to them by loosening it from the bottom. It is in fact a common sight to see a flock of baldpates in attendance on a group of feeding swans.

VOICE: This is a rather silent bird, its only calls hissing and snorting notes and a peeping note from young birds. In flight this swan's wings make a loud, rather musical throbbing sound that can be heard for a long distance.

NEST: (I. 35, P.) Generally a pair exercise complete territorial dominance over a considerable area—often the whole of a pond or small lake; only rarely is anything like a colony formed. The nest is a large pile of sticks, roots, and other trash on a small islet in the shallow marshy margin of a pond or on the bank near the water. The 5 to 7 eggs (4.5 x 2.9) are tinged with gray- or blue-green.

RANGE: (P. M.) Breeds from Great Britain, s. Sweden, and n. Germany east to e. Siberia and south to Iran. Winters south to n. Africa, n.w. India, and Korea. Introduced by man in many other areas. In North America, well established on Long Island and the lower Hudson Valley. Wanders along the coast to c. New Jersey and s. Massachusetts.

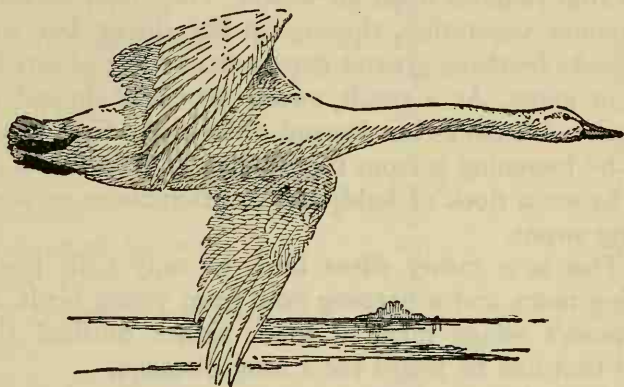
Whistling Swan*

Cygnus columbianus—~~3~~3
L. 52; W. 83; Wt. 16 lbs.

IDENTIFICATION: The small yellow area in front of the eye is distinctive, but it is often absent. The bird, however, has a very characteristic call. Young are washed with sooty-brown, and the bills are mottled with pink instead of being wholly black as in adults.

HABITS: A wedge of these great birds migrating high in the air, calling as they go, is a thrilling sight. They make only a

few stops between their breeding grounds and their winter home; generally these are at the same place year after year and the bird is a rare straggler elsewhere. Swans have to run over the water quite a distance to build up speed for a take-off. This means that they cannot escape danger quickly by flying and makes their stop on the Niagara River above the Falls very hazardous. In some years the swift current sweeps many to their death before they realize they are in danger.



In the North the Eskimos use the eggs and flesh for food, and the down for clothing. Elsewhere this bird has enjoyed full protection for many years, and it seems likely that in the future the hunting of this and other species that breed in the Far North will be limited to Eskimos and northern Indians. In their economy an ample supply of such waterfowl is a necessity and no substitute is available. With us, on the contrary, waterfowl hunting is a sport.

Like all swans, this bird is a vegetarian, feeding largely on underwater plants. Its vigorous rooting loosens the bottoms on which they grow and seems to have an invigorating effect on the beds, the ultimate effect being the production in subsequent years of even more food for themselves and other waterfowl.

VOICE: The babble of a flock varies considerably in volume and generally suggests that of a flock of Canada geese, although higher-pitched and more musical. There is a curious quavering quality to the sound despite its clamorousness. The whoop of a single bird is of 3 notes with a strong accent on the middle.

NEST: A bulky pile of grass, moss, and roots on an island or bank of a small pond. The 4 or 5 eggs (4.1 x 2.7) are creamy-white.

RANGE: (M.) Breeds from about Lat. 74° N. on the Arctic Islands from Baffin Island west, n. Alaska, and n.e. Siberia south to Southampton Island, n. Mackenzie, and the Alaska Peninsula. Winters mainly on coastal bays from Chesapeake Bay to Currituck Sound and from s. Alaska to the n. San Joaquin Valley. Rarely south to n. Florida, the Gulf Coast to Texas, and s. California.

Trumpeter Swan*

Cygnus buccinator—~~3~~ 3
L. 65; W. 100; Wt. 30 lbs.

IDENTIFICATION: The trumpeter's best field character is its voice. Adults always have a solid black bill which in the young is clouded with crimson. The mustard-yellow feet and legs of the young are distinctive, although their dirty gray-brown plumage looks like that of other young swans.

HABITS: The trumpeter swan once bred over a vast area from James Bay, n. Mackenzie, and Alaska south to Indiana, Missouri, and Nebraska and migrated in winter as far as the Gulf Coast and s. California. It would have been too much to expect a fairly tame bird affording such a wonderful target to long survive the settlement of most of its breeding and wintering range. We are fortunate that a few survive in that great sanctuary for wildlife—Yellowstone Park—and in the wild parts of n. Canada. The some 400 birds in the Yellowstone area are virtually non-migratory, and because of the limited amount of natural food available in the few hot springs that stay open all winter the area can never carry many more. For this reason some of the young are captured each year and moved to other suitable areas in an attempt to repopulate some of its original range. The Canadian birds, estimated at 900, are more migratory. They winter on lake outlets and rapids in interior British Columbia and similar areas, as well as on small forest ponds and river-mouth tide flats on the Pacific coast. The food of this big swan seems to be the leaves, roots, and seed of sedges and other aquatic vegetation. Their feeding habits make them very vulnerable to lead poisoning, and several wintering populations have been almost wiped out by it.

VOICE: A distinctive, short, low-pitched, resonant *beep* that suggests an old-fashioned French taxicab horn and carries surprisingly well.

NEST: (I. 38, P.) In an old muskrat or beaver house or on a small islet in a shallow pond or marshy slough. The nest is a

broad platform of organic debris lined with down. The 7 to 8 eggs (4.3 x 2.8) are dull white.

RANGE: (P. M.) Breeds in n. British Columbia, n. Alberta, and the Yellowstone Park region. Winters in the coast region of s. Alaska, British Columbia, and on warm springs in the Yellowstone area.

Canada Goose*

Branta canadensis—~~3~~
L. 22-39½; W. 43½-76; Wt. 2½-14 lbs.

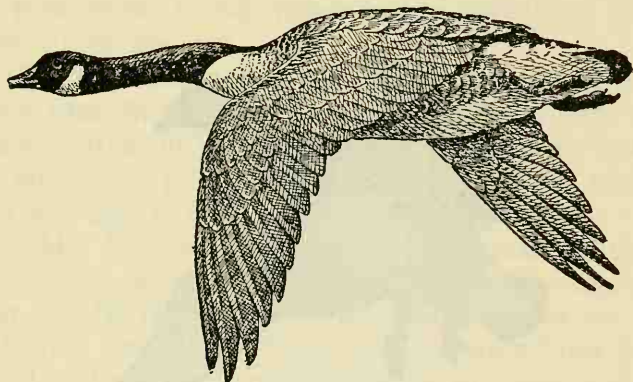
IDENTIFICATION: The conspicuous white sides of the head and the solid black neck are distinctive.

HABITS: (Age 9 yrs.) To the average person this is the wild goose whose great V-shaped flocks foretell the coming of fall or the return of spring as they pass noisily overhead night and day. Some are huge birds while others from the Far North are no larger than mallards. On the basis of size as well as differences in general color and habits, various attempts have been made to divide them into races or even species. These geese are so clannish in their habits and so firmly attached to certain breeding areas that close inbreeding is probably the rule. They mate for life, and the family unit stays together until after they return north. The rapid evolution of local races, varying greatly in size and habitat preferences, is undoubtedly favored by these facts. In effect each little colony or regional group is reproductively isolated from the rest of the population, a situation which in time leads to the accumulation of sufficient genetic differences to produce distinct local species.

During the breeding season these geese are found on small ponds and along rivers, in wooded regions as well as in the extensive marshes of the West. In the Far North they nest inland and along the coast among the ponds and lakes of the open tundra. During fall and winter they occur on fresh and salt water, feeding in the shallows and adjacent marshes. Grainfields are often favorite feeding grounds, but the feeding habits of these and other geese vary erratically from region to region. Here they glean waste grain in the fall; there they graze on new shoots of spring and winter crops. They like the grass that springs up after a grass or marsh fire, and they can feed under water like swans, obtaining seeds, leaves, tubers, and roots of aquatic plants, including those of such species as eelgrass and sea lettuce. Little animal food is taken except along the coasts, where certain

distinct races frequent tidal flats and appear to depend heavily on marine invertebrates.

Geese usually feed twice a day—early morning and late afternoon—repairing at other times to a safe resting place on a sand bar or out in open water. Jack Miner demonstrated years ago that even a small farm pond near a house would fulfill their need for a resting place once the geese realized they were safe on it. As a result many similar “sanctuaries” have been established. Although those who create them invariably do so with the best of intentions, some of these concentrations draw hunters to their outskirts in such numbers that the geese are virtually slaughtered as they move in and out in loose low-flying groups to nearby feeding areas.



VOICE: Varies in different races from a deep, resonant double honk to a high-pitched, almost cackling call.

NEST: (I. 26, P.) Generally on the ground but occasionally in a tree in the abandoned nest of a large bird like an osprey. The larger races build up a flat mound of grasses, often on a foundation of sticks. These are usually placed on high ground near water or on a small islet in a pond, muskrat and beaver houses being common sites. Smaller races seem more inclined to use a depression sparingly lined with grass and the customary blanket of down. The normal clutch is 5 creamy-white eggs (2.4–3.9 x 1.5–2.5).

RANGE: (P. M.) Breeds through Arctic America from Labrador, s. Baffin Island, Victoria Island, n. Alaska, and n.e. Siberia south to Newfoundland, James Bay, South Dakota, n. Colorado, and n. California. Winters from Nova Scotia, s. Ontario, South Dakota, and s.e. Alaska south to c. Florida, the Gulf Coast of Mexico, n. Mexico, and Japan. This species domes-

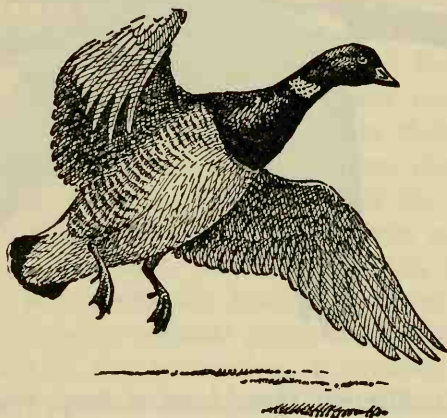
ticates readily, and when captive birds are allowed to go wild again they build up small local and relatively non-migratory populations.

Brant*

(Brent Goose)

Branta bernicla—~~3~~3
L. 24; W. 45; Wt. 3 lbs.

IDENTIFICATION: The small size, short neck, black chest, pale flanks, and very long white tail coverts are distinctive. The race that winters chiefly in the Pacific has a slaty-brown breast while the common Atlantic race has a pale gray breast that contrasts sharply with the dark chest. Young are similar except for light edgings on the back and wing-covert feathers and a poorly developed neck patch.



HABITS: During the non-breeding season this small sea goose is a bird of shallow coastal bays, where it feeds at low tide on beds of aquatic plants growing in shallow water. It also seems to require large quantities of sand, which it gets from nearby sand bars to which it moves as the tide rises. The roots and succulent white bases of eelgrass are a favorite food, and great concentrations occur on beds of this plant. On water the brant ride high with upturned tails, often tipping up to feed and continually pivoting as they pick up food from the surface. These little geese are fast fliers with long pointed wings and a rapid wingbeat. They are strongly gregarious, moving about in long undulating lines of 20 to 50 birds abreast, generally low and invariably over water, as they have a curious aversion to crossing even a narrow strip of land. In the North on their breeding grounds, however, they appear

to feed on land to some extent, taking the leaves and buds of some of the commoner flowering plants of the tundra.

The brant is an example of a dangerously overspecialized bird, too dependent on a single plant species for food. Eelgrass became so important to it that a die-off of the plant virtually all over the world, which started in 1931, greatly reduced its numbers. On the Atlantic coast only a small percentage of the original population survived by turning for food to the algae known as sea lettuce (*Ulva*) and the roots of marsh sedges. As eelgrass is now slowly returning, the brant can probably become abundant again, provided the small breeding stock that survives is carefully protected.

VOICE: A drawn-out, rolling, and guttural honking note as well as various grunting and hissing sounds. When the birds are in a flock these sounds blend into a babble of noise that carries a long distance.

NEST: (P.) Islets along the coast or in nearby inland ponds are favorite sites. At times the nests are bunched in loose colonies. Nests vary from little more than a mass of down in a hollow to a substantial pile of moss and lichens lined with down. The 4 or 5 eggs (2.8 x 1.9) are a dull cream color.

RANGE: (M.) Breeds on the islands and coasts of the entire Arctic Ocean south to Bering Strait and the Greenland coasts to Lat. 70° N. Winters on the northern coasts of the Atlantic and Pacific oceans. In North America from New Jersey to North Carolina and Vancouver Island to Lower California.

Barnacle Goose*

Branta leucopsis—~~3~~
L. 25; W. 52; Wt. 4 lbs.

IDENTIFICATION: The extensively white face is distinctive. In the browner-backed young birds this is tinged with dusky and the flanks are more strongly barred.

HABITS: This brantlike bird of the Far North is one of the most fearless of geese. Although generally found close to the sea-coasts, where it feeds to some extent on exposed mud flats, the barnacle's chief food is the grass in nearby pastures and croplands. Like so many birds that nest in Greenland, its normal wintering grounds are wholly European.

VOICE: A rapid series of short, shrill yelps. A flock sounds like a pack of terriers.

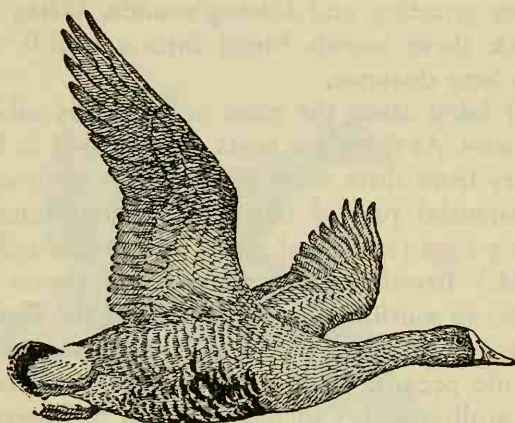
NEST: (I. 25, P.) In colonies on rock ledges, cliffs or mountainsides, occasionally on a rocky island. The 4 grayish eggs (3.0 x 2.0) are laid in a hollow and surrounded with down.

RANGE: (M.) Breeds in n.e. Greenland, Spitsbergen, and Novaya Zemlya. Winters south to Great Britain and the shores of the Baltic Sea. There are occasional records for the Atlantic coast south to North Carolina.

White-fronted Goose*

Anser albifrons—~~4~~
L. 29; W. 58; Wt. 5½ lbs.

IDENTIFICATION: The uniformly brownish fore parts and dark-blotched pale breast of adults are distinctive. Young have yellowish bills, legs, and feet but otherwise closely resemble young blue geese.



HABITS: No other goose has equal speed and agility on the wing. When necessary the bird can rise almost vertically into the air. The "specklebelly" commonly occurs in large, noisy, V-shaped flocks during migration, and vast numbers used to gather on some of its wintering grounds. Shallow ponds and marsh sloughs are its usual resting and loafing places. In some areas the geese feed heavily on aquatic plants and marsh grasses; in others their favorite foods appear to be waste grain from stubble fields and, later, the young leaf growth in newly planted grainfields. Pasture lands attract them, especially if recently burned over or heavily enough grazed to stimulate an abundant fresh growth. In the Arctic these geese eat many of the common tundra plants and a great many berries from the low-growing plants of wet or boggy areas.

VOICE: A laughlike series of rapidly repeated, high-pitched paired notes with a melancholy tone.

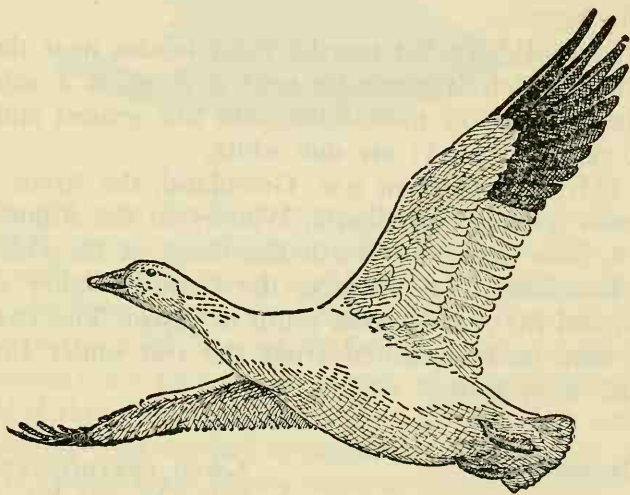
NEST: (I. 25, P.) Located in open tundra, often in groups near small bodies of water; also on upland and mountain slopes. The nest is a cup of moss and grasses lined with down and well concealed in a natural hollow. The 5 or 6 eggs (3.1 x 2.1) are light buff or cream color.

RANGE: (M.) Breeds on various islands and points on the mainland shores of the Arctic Ocean. In North America on the w. coast of Greenland from Lat. 72° N. to 66° N., and from Coronation Gulf west to the Yukon delta. Winters south to the Mediterranean, n. India, and Japan, and in North America on the Gulf Coast of Louisiana and Texas, the central valleys of the Pacific States, and c.w. Mexico.

Snow Goose*

Chen hyperborea—~~4~~4
L. 29; W. 58; Wt. 6 lbs.

IDENTIFICATION: The black primaries are not conspicuous except in a flying bird, but on water the short neck and the tail carried high distinguish this goose from a swan. Young birds are irregularly marked with various tones of ashy-gray. Rust stains are common on the face and head and sometimes on the breast.



HABITS: These geese migrate in great flocks that move across the sky in curved diagonal lines and broad V's. Away from their regular and somewhat restricted routes of travel and a few concentration areas, they are rather uncommon. Usually they keep to themselves, seldom mixing freely with any geese except their close relative, the blue goose, and the rare Ross'

goose. They visit stubble fields for waste grain and browse on pasture grasses and young grain shoots, but in most areas they are grubbers and eaters of roots. Their favorite foods in the North and on their coastal marsh wintering grounds are the roots and bases of various rushes, sedges, and marsh grasses. Here they seem to prefer areas that are covered with a few inches of water. Often they so concentrate their feeding that they turn the area into a wallow of loose mud, floating plant debris, droppings, and feathers that produces an odor which sometimes carries for miles.

In many parts of the North "waxies," as they are called, are an important part of the food supply of Eskimos and Indians. Early in the season Eskimos gather the eggs by the thousands, and later, when the birds are molting and cannot fly, both adults and young are driven into crude corrals and killed for food and down. Farther south in early fall Indians take heavy toll by shooting them at some of their local concentration points. Despite all this and the threat from hunting farther south, this bird continues to be the most abundant goose in North America.

VOICE: A high-pitched falsetto honking that produces a sustained, somewhat musical clamor when uttered simultaneously by a flock.

NEST: (I. 22, P.) In flat marshy grass tundra near the coast. The nest, which is generally near a pond, is a substantial cup-shaped mass of moss lined with fine grasses and down. The 6 eggs (3.1 x 2.1) are dull white.

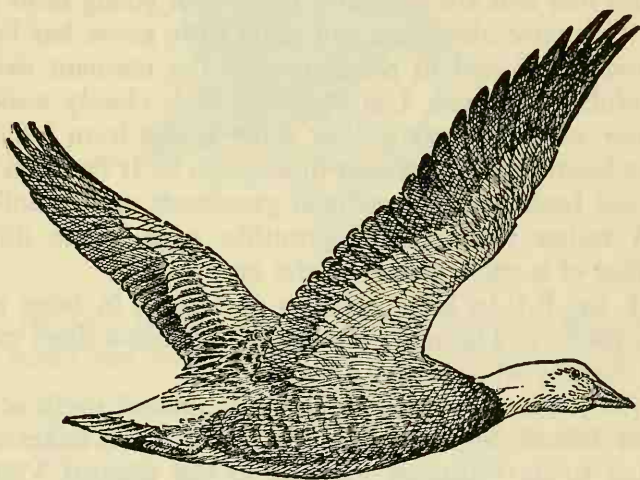
RANGE: (M.) Breeds from n.w. Greenland, the Arctic Islands and coast west to n.e. Siberia. Winters on the Atlantic coast from s. New Jersey to North Carolina, on the Gulf Coast from Louisiana to n. Mexico, the Central Valley of California, and the Asiatic coast south to Japan. The East Coast birds were once separated from the rest under the name "greater snow goose."

Blue Goose*

Chen caerulescens—~~4~~
L. 27½; W. 54; Wt. 5¼ lbs.

IDENTIFICATION: Adults vary in the amount of rust stain about the head and the extent of the dark color on the under parts. Young have blackish secondaries as well as primaries and dusky to slightly pinkish bills, legs, and feet. The curious so-called "grinning patch" on the side of the bill is present only in blue and snow geese.

HABITS: Almost anywhere an occasional blue goose may turn up among snow geese, but the main population is always concentrated within a relatively small area. Flocks of more than several hundred thousand birds are not uncommon along the 200-mile stretch of Louisiana coastal marsh, where they winter. In spring large flocks stop at various points in the n. Great Plains to feed on the newly sprouted grain, but with this exception the geese have a strong affinity for salt water and are never found much more than 10 miles inland. Like snow geese, blues live chiefly on the roots, tubers, and bases of salt and brackish marsh plants.



The status of the blue goose as a distinct species is questioned by many ornithologists. The fact that blue and snow geese differ only in color leads many to believe them to be dark and light phases of a single species. They readily interbreed in the wild (the whiter-bellied blues are supposed to be hybrids), but they do not appear to do so as freely as they would if the birds were unconscious of difference and mated at random. The marked clannishness of geese and the tendency of family units to stay together might, however, account for this.

VOICE: Indistinguishable from that of the snow goose.

NEST: (I. 24, P.) The nesting habits of the blue goose are in no way different from those of the snow geese that nest with them in the same area of coastal grass tundra.

RANGE: (M.) Breeds in s.w. Baffin Island and Southampton Island. Migrates south to the east side of Hudson Bay, then to

the southern end of James Bay and from there, in a largely non-stop flight, direct to the wintering ground on the coast of Louisiana. In the more leisurely spring flight, goes north as far as Manitoba, east to James Bay, and on to the breeding grounds.

Ross' Goose*

Chen rossi—~~4~~4
L. 24; W. 50; Wt. 2¾ lbs.

IDENTIFICATION: Its size (little larger than a mallard) and warty-based, rather stubby bill without a "grinning patch" on the side are distinctive. Young birds have pinker bills, legs, and feet and are generally paler than young snow geese.

HABITS: This once abundant and tame little goose has been so dangerously reduced in numbers that the remnant needs to be carefully protected. Unfortunately it is closely associated in winter with the very similar snow goose, from which the average hunter usually cannot distinguish it. It feeds on waste grain and fresh young growth in grasslands and grainfields.

VOICE: A rather weak double gruntlike note—quite different from that of a snow goose—is the only call.

NEST: (I. 21, P.) In loose colonies on islands in lakes in low tundra country. The nests are grass- and down-lined cavities with 4 creamy-white eggs (2.7 x 1.9).

RANGE: (M.) Breeds on the Canadian mainland south of King William Island. Migrates west via Great Slave Lake and w. Montana to its wintering grounds in the Central Valley of California.

Black-bellied Tree Duck*

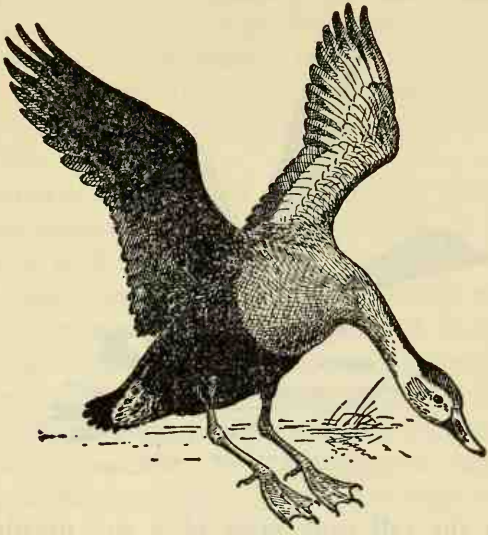
Dendrocygna autumnalis—~~6~~6
(Black-bellied Whistling Duck) L. 21; W. 37; Wt. 2 lbs.

IDENTIFICATION: The long neck and the white wing patch, which in flight covers the whole central area of the upper wing surface, are distinctive.

HABITS: This largely nocturnal duck frequents the banks and shallow borders of rivers and ponds but seldom seems to alight on, or swim in, deep water. The birds fly about from tree to tree with ease and usually resort to a woodland when disturbed. They do much of their feeding in shallow water and are fond of corn, visiting the fields as soon as it starts to ripen.

VOICE: A peculiar and characteristic shrill, chattering whistle, which it utters constantly on the wing.

NEST: (P.) In cavities in trees in open woodland, often some distance from water. Twelve creamy-white eggs (2.1 x 1.5) are a normal clutch.



RANGE: (P. M.) Breeds from s.e. Texas and w.c. Mexico south to s. Brazil and Ecuador. Winters from c. Mexico south.

Fulvous Tree Duck*
(Fulvous Whistling Duck)

Dendrocygna bicolor—~~6~~
L. 19; W. 36; Wt. 1½ lbs.

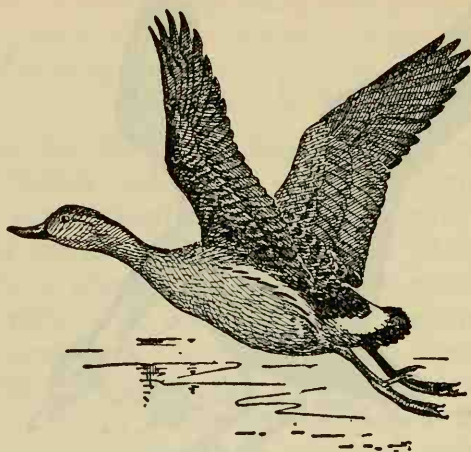
IDENTIFICATION: Long legs, long neck, and upright carriage characterize tree ducks. In flight this species shows a line of white between the dark undersurface of the wing and the body, and a white tail base. The wing beat is slow and the bird thrusts head and feet downward when alighting.

HABITS: Densely grown-up marshy areas adjacent to open croplands—especially low-lying, frequently flooded areas like rice fields—attract this species, which is so nocturnal that it is seldom seen. The birds appear to do most of their feeding while walking about on land. Wild seeds, waste grain, corn, acorns, and green vegetation like grass and alfalfa are their chief foods.

The curious, discontinuous distribution of this bird suggests either a decadent species of which only a few relics survive or an aggressive species which is spreading and colonizing new areas. The former appears more likely, although the bird seems to have found certain types of recently created man-

made habitats so much to its liking that it has increased markedly in some of these localities.

VOICE: A thin, high-pitched, almost ploverlike double whistle uttered on the wing.



NEST: (P.) In the tall rank grass of a wet meadow or in a dense bed of cattails or other marsh vegetation. Very rarely in a tree hollow. The nest varies from a grass-lined hollow on high ground to a basket woven of the surrounding vegetation that holds the eggs well above the water. A normal clutch is about a dozen eggs, but now and then 2 or more females dump eggs into a nest until 30 or more have accumulated, only to be abandoned. The eggs (2.1 x 1.6) are creamy or buffy-white.

RANGE: (P. M.) This duck now occurs in 5 widely separated parts of the world: coastal Louisiana and Texas; c. California south to c. Mexico; n. South America; s. Brazil and n. Argentina; e. Africa; and India.

Mallard

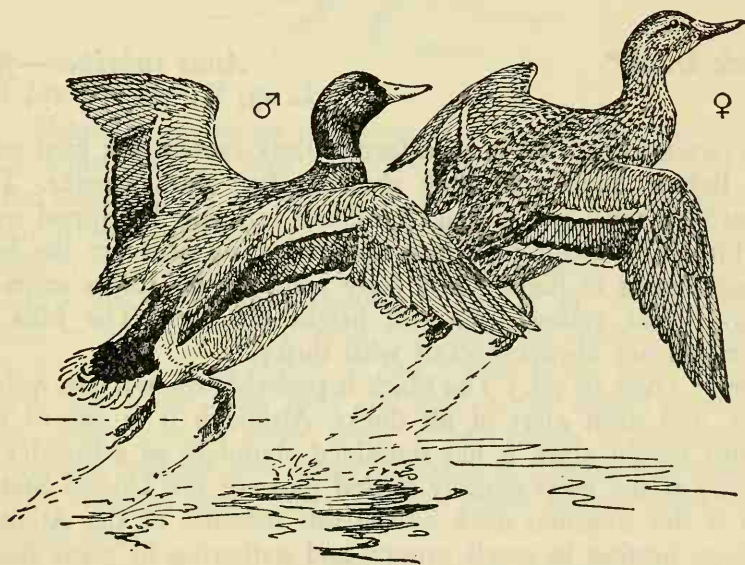
Anas platyrhynchos—~~7~~7
L. 22½; W. 36; Wt. 2½ lbs.

IDENTIFICATION: In the air the 2 white borders of the violet-blue speculum, clear white underwing linings, and largely white tail (not clear white in the female) are distinctive. This commonly domesticated duck should be memorized as a standard for comparison with other ducks.

HABITS: (Age 15 yrs.) The mallard is a hardy, adaptable bird that domesticates readily. It is the most abundant wild duck in the world. Many go only as far south in winter as they

must to find open water, and in spring they push north as fast as the ice melts. In general mallards seem to avoid salt water, but almost any body of shallow fresh water may harbor a few pairs. They are typical river- and pond- or surface-feeding ducks and prefer water that does not exceed 12 to 16 inches in depth—the maximum they can reach when “tipped up.” Like other “puddle ducks,” mallards can launch themselves into flight with a single, almost vertical leap from the surface of the water.

The mallard is primarily a seedeater. Seeds of sedges, grasses, and smartweeds are its staple food. It eats the leaves and stems as well as the seeds of such plants as pondweeds, duckweed, and coontail. At times the seeds of bottom-land trees like water elm, hackberry, oak, and hickory are taken in great quantities, and in recent years mallards have learned to visit dry stubble fields for waste grain. Their animal food consists chiefly of fresh-water mollusks, especially snails and aquatic insects, but they are opportunists and will eat fish eggs and grasshoppers and will even scavenge on dead fish.



Crosses between mallards and other ducks, like the pintail (Plate ~~7~~), that breed in the same region are not uncommon. With the introduction of domestic mallards and the release of hand-raised wild birds into the breeding range of the black duck, crosses between these closely related species have become quite frequent (Plate ~~7~~). Usually the par-

entage of duck hybrids is not difficult to guess, as the birds are a patchwork of the characters of each parent species. There is seldom much blending of characters.

VOICE: Female, a loud, resonant *quack*. Male, a softer, higher-pitched note that carries well.

NEST: (I. 26, P.) Normally in dense reeds or grass close to a body of fresh water. Occasionally a long distance from water in a brush pile or under a fallen log. Rarely in hollows in trees or up in a thick cluster of branches. The nest is usually a hollow lined with dead grass or reeds and filled with down.

The 10 eggs (2.3 x 1.6) are light greenish-buff to nearly white.

RANGE: (P. M.) Circumpolar, breeding south from the Arctic Ocean to the Mediterranean, Persia, Tibet, c. China, and n. Japan; in North America from Nova Scotia, s. Ontario, w. Hudson Bay, n. Mackenzie, and n. Alaska south to n. Virginia, s. Illinois, n. Kansas, s. New Mexico, and n. Lower California. Winters along the coast from Nova Scotia and inland from Maryland, n. Indiana, Nebraska, w. Montana, c. Alaska, and the Aleutian Islands south to the West Indies and s. Mexico.

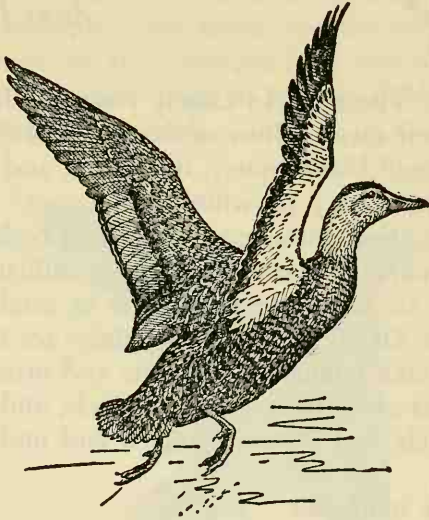
Black Duck*

Anas rubripes—~~7~~
L. 23; W. 36; Wt. 2¾ lbs.

IDENTIFICATION: This is a uniformly dark sooty-black bird with a lighter head and neck showing fine dark streaks. The purplish speculum is black-bordered but may be tipped with white. The gleaming white underwing surfaces are the best field marks in flight. Only fully adult winter males seem to have clear yellow bills and bright red feet. The bills of females are always flecked with dusky.

HABITS: (Age 10 yrs.) The black is probably the wariest, quickest, and most alert of all ducks. Although it is one of the most sought after, it has remained abundant as a breeder in some of the most densely settled parts of the United States. It is the common duck of the salt marshes of the Atlantic coast, nesting in small groups and gathering in great flocks in the fall. During the non-breeding season black ducks spend the day in rafts far out in open water or sitting on the ice of a frozen lake and do most of their feeding at night. They eat more submerged plants than do mallards. Pondweeds, eelgrass, and wild celery are taken in about equal quantity with seeds of sedges, grasses, and grains. When ice and deep snow lock up these foods the birds live on animal food, which they

seem to have no trouble finding. Most of it comes from the shallow flats exposed at low tide, where blue mussels, periwinkles (650 in one stomach), and other shellfish abound. Shrimp, sand fleas, sow bugs, and other crustacea and insects are often important. Occasionally they take small fish.



Nearly every winter the presence of ducks dying of disease, or more often of lead poisoning, leads to false reports that the local black duck population is starving. Any healthy duck can fly farther south if food gets scarce, but the black duck's ability to utilize marine life seldom makes this necessary. Unfortunately, lead poisoning is taking an ever-increasing toll as the quantity of lead shot into our marshes increases with each hunting season. A few pellets sifted from the mud with seeds and other food and held in the duck's gizzard, to be slowly ground away, seem to be enough to paralyze the stomach muscles and cause apparent starvation and death.

VOICE: Females quack like mallards. Males have a short, weak, reedy note.

NEST: (I. 27, P.) On the ground on an isolated islet or other high ground near a marsh or open water, generally well hidden in a tangle of tall grass or shrubs. Occasionally a nest is built in an old crow or hawk nest high in a tree or off in a woodland near a small stream. The nest is an often bulky cup of grasses and leaves with a lining of down that is added to as incubation progresses. The 9 eggs (2.3×1.7) vary from creamy-white to greenish-buff.

RANGE: (P. M.) Breeds from Ungava, n. Ontario, and e. Manitoba south to e. North Carolina, Pennsylvania, n. Indiana, and n.w. Iowa. Winters from Nova Scotia, c. New York, n. Ohio, and e. Nebraska south to s. Florida and the Gulf Coast west to s.c. Texas.

Mottled Duck*
(Florida Duck)

Anas fulvigula—~~7~~
L. 21

IDENTIFICATION: These ducks closely resemble female mallards except for their clear yellow or orange bills (bills of females have a few small black spots), dark tails, and black-bordered speculum, which may be white-tipped.

HABITS: The mottled duck occurs in a wild region of vast fresh or brackish marshes that are relatively difficult to penetrate. Usually they are encountered in pairs or small family groups up to a dozen. Of all puddle ducks, these are the most carnivorous. They take quantities of snails and other mollusks and small numbers of crayfish, aquatic insects, and fish. The plant portion of their diet is seeds, tubers, and underwater vegetation.

VOICE: Like the mallard's.

NEST: (I. 27, P.) On the ground, on a high place in or near a marsh or on an island; well concealed in a dense clump of grass or under a bush. The down-filled grass nest usually holds about 9 creamy- to greenish-white eggs (2.2 x 1.6).

RANGE: (R.) Occurs in s. Florida north along the coasts to the middle of the state and inland to Orange Lake, and in the coastal regions of Louisiana and Texas.

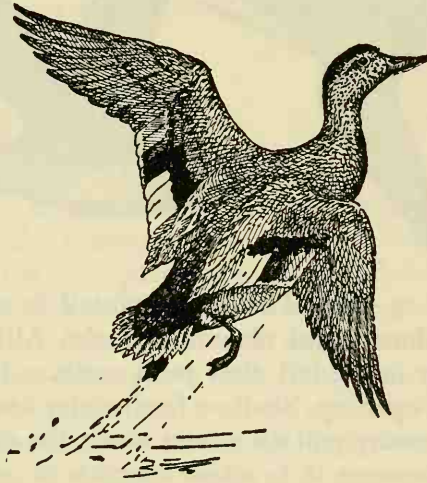
Gadwall

Anas strepera—~~7~~
L. 20; W. 34; Wt. 2 lbs.

IDENTIFICATION: In flight the speculum, which is white near the body, then black and gray, and the reddish-brown forewing (less noticeable in females) are diagnostic. The male's uniform lead-gray color, black stern, and paler, browner head and neck help identify it on water. Aside from yellowish-orange feet and a touch of orange-yellow on the side of the bill, the female is quite like the larger female mallard and pintail when on the water.

HABITS: This rather shy, early-fall and late-spring migrant normally occurs in small flocks and seldom seems very abundant. It does, however, have the widest range of any duck in

the world. Shallow streams, ponds, and lakes, especially when bordered by a dense fringe of tall reeds, are favorite haunts. Occasionally the birds are seen in brackish, but seldom in salt, marshes. Like all ducks, the gadwall has an interesting courtship ritual, rival males displaying before the female in flight. Gadwalls are almost wholly vegetarian. Leaves, stems, and tubers of various pondweeds are their chief foods. Others are coontail, widgeon grass, algae, and the seeds of sedges and grasses. If necessary, they dive for food and at times leave the water to feed on waste grain in stubble fields and on acorns and other mast in the woods.



VOICE: The female has a rather subdued quack, but the male has quite a repertoire of croaks, whistles, rattles, and trills.

NEST: (I. 27, P.) Sites vary from islands in lakes to uplands some distance from water. The nest, which is always well hidden in a dense tangle of tall grass, weeds, or shrubs, is just a hollow in the ground lined with plant material and down.

The 11 eggs (2.2 x 1.6) are creamy-white.

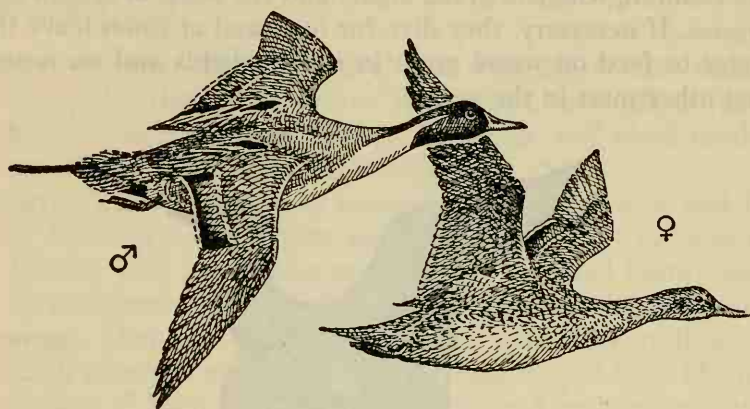
RANGE: (P. M.) Breeds over much of the Northern Hemisphere between Lat. 40° N. and 60° N. In North America from c. Manitoba, n. Saskatchewan, and s. British Columbia south to s. Wisconsin, s. Kansas, n. New Mexico, and c. California. It now seems to be reclaiming former range in the East, nesting sparingly in w. Pennsylvania and on the Atlantic coast from Long Island to North Carolina. Winters from Maryland, s. Illinois, c. Texas, and Oregon south to c. Florida, the Gulf Coast, and s.c. Mexico.

Pintail

Anas acuta—~~6~~

L. ♂ 27; ♀ 21½; W. 34; Wt. 2 lbs.

IDENTIFICATION: Even in the female the long neck and pointed tail are good field characters. The dark blue-gray bill and feet and, in flight, the pointed wings with white along the rear edge of the iridescent brown speculum are diagnostic.



HABITS: (Age 13 yrs.) The hardy pintail is one of our most widely distributed and abundant ducks. Although the birds migrate early in the fall, they push north as fast as the ponds and marshes open up. Shallow fresh-water areas are the usual habitat, but many pintails winter along the coast, where they are not uncommon in brackish marshes or resting by day in rafts on open bays. In very cold weather, when other feeding grounds are frozen, they visit uplands for waste grain or acorns or go to the tidal flats for marine animals. They are chiefly seedeaters and take little other vegetable material. Seeds of pondweeds, sedges, grasses, and smartweeds are staple. At times they eat considerable animal material in the form of snails and other shellfish, crabs and aquatic insects.

There is no stronger, faster, or more dexterous flier among ducks. Even so, the regular migration of such ducks as these and shovelers to the Hawaiian Islands in winter is an extraordinary feat, although occasionally some of the birds miss the way. A flock of 22 very tired pintails turned up on Palmyra Island, 1,100 miles south of Hawaii, in 1942, and one wore a band placed on it in Utah 82 days earlier, after it had been cured of botulism poisoning.

VOICE: The male has a seldom-heard low double whistle, the female a low quack.

NEST: (I. 23, P.) The down-lined nest in a hollow in dry ground may be near water but is often a long distance from it. Sometimes the nest is well concealed under rank grass or a bush, but quite often it is out in open prairie with little to hide it. The 8 eggs (2.1 x 1.5) in an average clutch are buff-green.

RANGE: (P. M.) Circumpolar. Breeds from n. Europe and Asia south to n. Great Britain, s. Russia, and s. Siberia. In North America breeds from n. Mackenzie and n.w. Alaska east to Hudson Bay and south to Iowa, n. Colorado, and s. California; casually east to New Brunswick. Winters from s. New England, s. Ohio, c. Missouri, New Mexico, and s. British Columbia south to the West Indies and Panama, also west to the Hawaiian Islands.

White-cheeked Pintail*
(Bahama Pintail)

Anas bahamensis—~~6~~
L. 19

IDENTIFICATION: The clear white face and throat, red bill base, and, in flight, the narrow green speculum broadly bordered with buff and the very pale buffy tail are distinctive.

HABITS: This largely coastal duck seems to be quite at home on vast shallow tidal flats. Frequently a pair or family group is flushed from the saline ponds that occupy the centers of the small mangrove islands. Much of the bird's feeding is done in the marshes just back of the coast. It is largely vegetarian and is known to feed on the seeds and leaves of widgeon and musk grass, both plants of brackish areas.

The s. Florida coast seems to have many ideal habitats for this duck, which occurs in the Bahamas as far north as Abaco Island off Palm Beach, yet there is to date only a single recent record—a bird shot near Cape Canaveral. It has been suggested that these ducks may have once been resident in Florida but proved so vulnerable to hunting that they were wiped out in the early settlement days. Certainly its wide range and abundance in South America indicate that it is a prolific and vigorous species that could probably be readily re-established in s. Florida.

VOICE: The male of this very silent bird is said to have a low, squeaky call, the female a high-pitched quack.

NEST: (I. 25, P.) A rough mat of grasses on the ground, hidden in the dense vegetation of a swamp border or among the stiltlike roots of the mangrove trees. The 8 eggs (2.0 x 1.4) are pale reddish-buff.

RANGE: (R.) Occurs in the Bahamas, Greater Antilles, and n. Lesser Antilles; in South America from the Guianas south to c. Argentina and west to n. Chile.

Teal

Anas crecca—~~5~~
L. 14; W. 23; Wt. 12 oz.

IDENTIFICATION: Males of this species and the green-winged teal differ only in the position of their one white streak—horizontal and above the wing in the European bird. Females are indistinguishable.

HABITS: Many ornithologists regard this and our green-winged teal as races of a single world-wide species. They seem alike except for the already noted plumage difference in males. They are usually found together, and males of both species have been observed courting the same female.

RANGE: (P. M.) Breeds from Iceland east across Europe and Asia (north to Lat. 70°) to the Aleutian Islands and south to the Mediterranean, Turkestan, Mongolia, and Hokkaido. Winters south to Nigeria, Kenya, Ceylon, and the Philippines. Rare but regular winter visitor to the Atlantic coast south to North Carolina.

Green-winged Teal

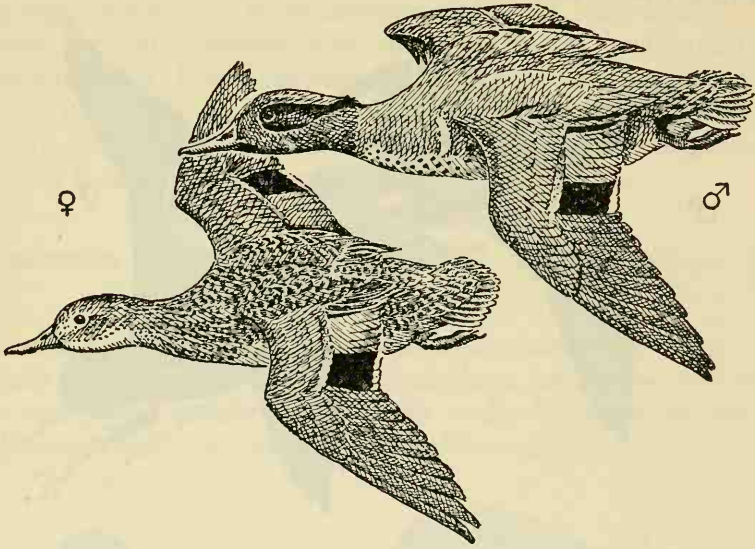
Anas carolinensis—~~5~~
L. 14; W. 23; Wt. 12 oz.

IDENTIFICATION: The size, short wings and neck, and small bill of this compact duck are fair field marks. In poor light only the males' buffy-yellow under tail coverts are conspicuous. In flight the wings look dark, as the iridescent green patch and brown edge of the speculum show up only in sunlight. The dull female is quite colorless except for the speculum.

HABITS: This tiny, hardy duck is a late-fall and early-spring migrant. It is commonly encountered in flocks of considerable size, the evolutions of which are truly remarkable. In tight formation and at high speed the birds twist, turn, and bank with miraculous precision. The shallow ponds and channels of fresh-water marshes are favorite haunts, but in cold weather salt and brackish areas are often visited. This teal is primarily a seedeater but takes some leaves and stems of aquatic plants and, in salt water especially, shellfish and crustacea. Sedges, pondweeds, grasses, and smartweeds supply the bulk of its food. Quite at home and agile on land, it often visits grainfields as well as woodlands, where acorns and other

nuts and wild fruits are obtained. These are among the birds that visit the shallow spawning grounds of the salmon in the western rivers and feed heavily on salmon eggs and the rotting flesh of spent salmon that have died after spawning.

VOICE: The call of the male is a short, abrupt whistle or similar trilled note; that of the female, a weak quack.



NEST: (I. 22, P.) A hollow in a grass clump or other cover, lined with grass and feathers and situated at varying distances from water. The 11 eggs (1.8 x 1.35) run from cream to pale olive-buff.

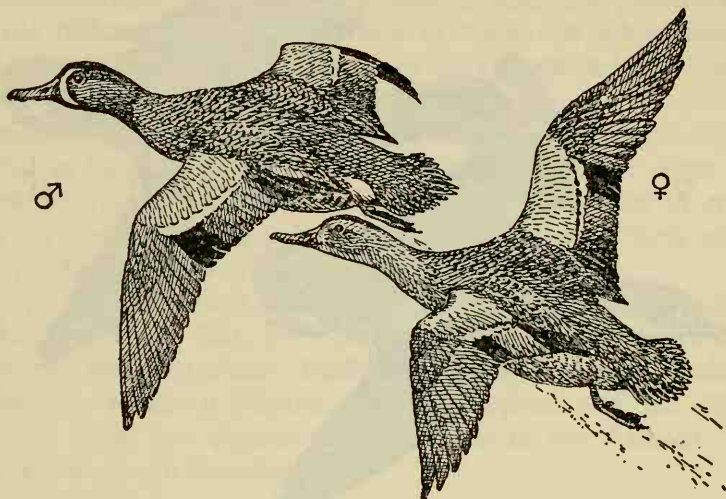
RANGE: (P. M.) Breeds from Quebec, James Bay, Great Slave Lake, n. Mackenzie, and c. Alaska south to the Gulf of St. Lawrence, s. Quebec, s. Ontario, n. Michigan, s. Minnesota, Nebraska, n. New Mexico, and c. California. Winters from s. New England, the Great Lakes, c. Montana, and s. Alaska south to the West Indies and Honduras.

Blue-winged Teal

Anas discors—#5
L. 15½; W. 24; Wt. 14 oz.

IDENTIFICATION: The pale blue inner wing coverts and the iridescent green speculum are characters this species shares with the next two. The uniformly pale pinkish-brown body color, white flank patch, and facial crescent of the breeding male are distinctive. In this species many males are slow in molting the femalelike "eclipse" body plumage which they

assume in summer before shedding their wing feathers and becoming temporarily flightless. Blue-wings do not take on full normal body plumage until December, while the drakes of most species have attained it by the end of September. On the water the female is virtually indistinguishable from a green-wing female, but she has a longer body and neck and a larger head and bill.



HABITS: Fresh-water marshes, small ponds, mud flats, and sluggish creeks are favorite haunts. Only rarely do blue-wings visit salt or brackish areas. Unless badly persecuted they are inclined to be tame and unsuspicious. As a result they tolerate civilization and nest in close proximity to man. Their unsuspiciousness and their habit of flying in compact flocks make them easier to shoot than most. As they are very early migrants in fall and equally late in spring, the breeding cycle is compressed into a short period and the young develop rapidly. With short hunting seasons the blue-wing's early migration often carries the bulk of the species south before shooting starts. Ninety-five per cent of the population is estimated to winter south of our borders, which means that the future of the species depends largely on the conservation practices of our West Indian and Latin-American neighbors. The 4 staple food items of the seed-eating ducks—sedges, pondweeds, grasses, and smartweeds—make up about three fourths of the fall and winter diet of these birds in the United States. Musk grass, pondweed leaves, duckweed, and considerable quantities of snails and aquatic insects and crustacea are eaten.

VOICE: The male has a sibilant peeplike whistle, the female a weak quack.

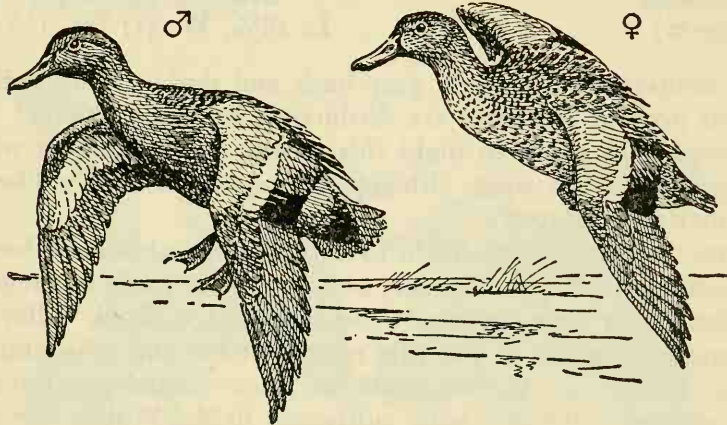
NEST: (I. 22, P., N. 42) On the ground, well concealed in long grass and as a rule near water, but occasionally on a sedge tussock or muskrat house surrounded by water. The well-made nest is built of soft grasses and the eggs are covered with a heavy blanket of down from the female's breast. The 9 eggs (1.8 x 1.3) in an average clutch are dull white.

RANGE: (P. M.) Breeds from New Brunswick, s. Ontario, c. Manitoba, n. Saskatchewan, and s. Yukon south to Florida, the Gulf Coast, s. New Mexico, and s. California. Winters from e. Maryland, s. Illinois, New Mexico, and s. California south to n. Brazil and c. Chile.

Cinnamon Teal

Anas cyanoptera—~~5~~
L. 15¾; W. 24½; Wt. 12 oz.

IDENTIFICATION: The uniform dark cinnamon-red head and body color, patches of which show even before the fall molt is complete, readily identify the male. Females cannot be distinguished with certainty from blue-wings.



HABITS: This close relative of the blue-winged teal largely replaces it in most of our Far West, where it is an abundant species. Wherever shallow bodies of water or sluggish streams are bordered with tules or other marsh plants this duck makes itself at home. The small reservoirs and irrigation ditches of western agricultural developments are readily accepted, even when close to civilization, by this remarkably tame and unsuspicious duck. It is seldom encountered

in large flocks and migrates early—factors that may account for its continuing abundance. The average diet is almost identical with the blue-wing's and, in general, the two species seem to occupy identical places in the wildlife communities in which they occur.

VOICE: Seldom more than a squeaky chatter from the male and a weak quack from the female.

NEST: Commonly in dense grass or weedy cover, often some distance from water, at times in dense beds of cattails. Upland nests are in hollows lined with grass and feathers, but in wet sites a woven cup of grass and leaves is fastened above the water to plant stems. The 11 or so eggs (1.9 x 1.4) vary from white to pale pinkish-buff.

RANGE: (P. M.) Breeds from s. British Columbia, w. Saskatchewan, e. Wyoming, s.w. Kansas, and w. Texas west to the Pacific States and south to c. Mexico; also in South America from c. Argentina and c. Peru south to the Strait of Magellan. North American birds winter south from c. New Mexico and c. California to Panama, occasionally on the coast of Texas and Louisiana.

Widgeon (Wigeon)

Mareca penelope—~~6~~
L. 18½; W. 31; Wt. 1½ lbs.

IDENTIFICATION: The pale gray back and darker reddish head and neck of the male are distinctive, as is the female's cinnamon-buff head. In flight this species shows no clear white area under the wing, although the upper surface is like an American widgeon's.

HABITS: It seems reasonable to suppose that this duck breeds sparingly in North America, as it occurs as a rare but regular migrant on both our coasts and in the Mississippi Valley. In Europe it breeds in the wild open marshes and grasslands of the North and farther south in more settled areas where woodlands alternate with cultivated fields. Within the past 100 years it has become established as a breeding bird in Great Britain and is still increasing and spreading. In contrast with most other ducks, this one, it seems, is favored by civilization. Widgeon are largely vegetarians. Pondweeds and widgeon grass are staple foods, but apparently the favorite fall food along the coast is eelgrass. European observers report that a good place to look for them is with flocks of brant that are pulling eelgrass to the surface, where they can get at it more readily.

VOICE: The noisy male has a prolonged rolling whistle, *whew-oo*, and a shorter sparrowlike chirp; the female, a rough growling sound and, when alarmed, a harsh quack.

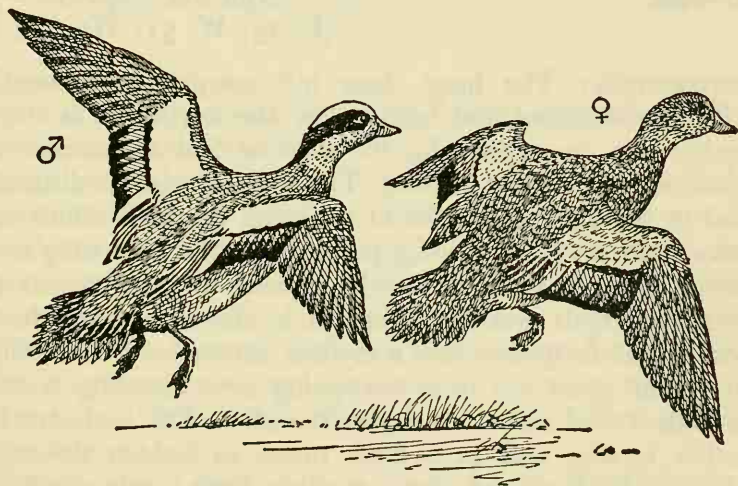
NEST: (I. 25, P.) The grass-and-down nest is on the ground, generally well hidden in tall rank grass or other vegetation, either near water or some distance away in a meadow. The 7 or 8 eggs (2.1 x 1.5) are creamy or buff.

RANGE: (P. M.) Breeds across all n. Europe and Asia from Lat. 71° N. south to Great Britain, Germany, Transcaucasia, Turkestan, and Manchuria. Winters south to tropical Africa, India, and the Marshall Islands. Occurs regularly in fall, winter, and spring in North America from s. Canada to Florida, the Gulf Coast, and s. California.

American Widgeon (Baldpate)

Mareca americana—#6
L. 19½; W. 32½; Wt. 1¾ lbs.

IDENTIFICATION: The male, with its white crown and flanks, is quite distinctive. The female is best known by the grayish head contrasting markedly with the pinkish-brown of the body. In flight the whole fore part of the inner wing is white above (grayish-white in female). This sometimes shows when the bird is on water.



HABITS: The American widgeon is an alert duck. On the water feeding birds ride high and pivot rapidly as they pick here and there at floating food. In the air dense flocks wheel and turn in perfect unison almost like teal. Shallow fresh or

brackish ponds are favorite habitats, but the birds also visit shallow coastal bays at times and feed on eelgrass. Almost wholly vegetarian except for a few snails, they take relatively few seeds but depend largely on leaves, stems, and buds of such plants as pondweed and widgeon grass, the two staple foods. They appear to like wild celery and are found stealing bits of this deep-water plant from canvasbacks, scaups, and coots, which can dive down and uproot it. Baldpates are at home on land and in spring have the gooselike habit of grazing on tender shoots of grass or grain.

VOICE: The male has a pleasant, mellow whistled note uttered in groups of 3. The female has only a weak, guttural quack.

NEST: (P.) A hollow in dry ground, lined with leaves, grass, and down, and in many cases hardly concealed. The site may be on an island in a lake or near water, or far away in open grassland or in the shelter of a woodland. The average clutch is 10 white to cream-colored eggs (2.1 x 1.5).

RANGE: (M.) Breeds from c. Alaska south, east of the coast ranges, to n. New Mexico and Arizona; east to Hudson Bay, Minnesota, and Nebraska, and sporadically to w. Pennsylvania. Winters from s. New England, the Ohio Valley, c. Utah, and s.e. Alaska south to the West Indies and Panama.

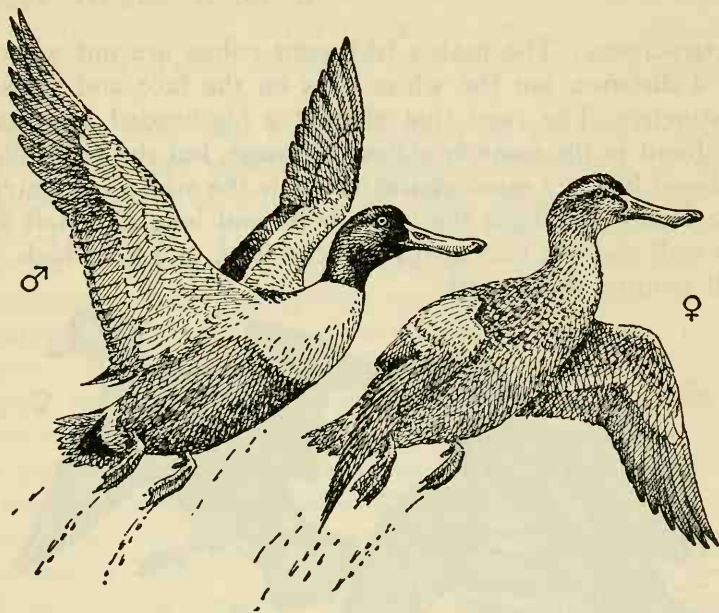
Shoveler

Spatula clypeata—~~5~~5
L. 19; W. 31; Wt. 1½ lbs.

IDENTIFICATION: The huge, long bill merging imperceptibly with the forehead and held below the horizontal is the female's best character, plus the short-necked appearance and tendency to ride low in front. The colorful male is distinctive and in the air shows a lot of white on the body. Both sexes have light tails and a wing pattern like the blue-wing's.

HABITS: The shoveler is closely related to blue-winged and cinnamon teals and as a migrant is almost as early in fall and as late in spring. It is a curious, rather bold duck, which in recent years has been occupying new breeding territory in well-settled areas. In flight, shovelers, like teal, are fast, rather erratic, and as a flock prone to sudden downward plunges. Shallow and often stagnant fresh-water ponds and marshy areas or mud flats are normal haunts, but the birds are often found in brackish marshes where widgeon grass grows. Shovelers commonly feed in small groups that mill around in a circle and churn up the mud. Since their food is strained from near the surface, they seldom have to "tip up."

An enormous development of the comblike teeth along the sides of the mandibles makes this whalelike manner of feeding possible. This is one of the most carnivorous of the dabbling ducks, taking large numbers of snails, aquatic insects, fish, and crustacea, many of them minute forms like ostracods. The rest of the diet consists of seeds and plants of the type preferred by teal.



VOICE: The male occasionally makes a deep, guttural, croaking sound, the female a weak quack.

NEST: (I. 22, P.) A slight hollow where the nest is concealed by dense grass is the usual site. Distance from water does not seem important. The nest has a lining of grass and a generous blanket of down that is slowly increased as incubation progresses. In all ducks incubation, which is carried on solely by the female, does not start until the last egg has been laid. Thus all young hatch and are ready to leave the nest at the same time. The average clutch is 11 olive-buff or grayish-green eggs (2.0 x 1.5).

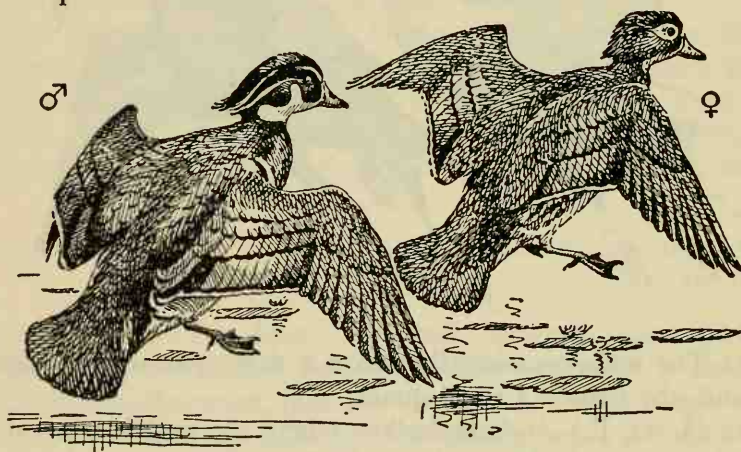
RANGE: (P. M.) A large part of the Northern Hemisphere. In Europe and Asia, breeds from the Arctic Circle south to France, Turkey, Turkestan, n. Mongolia, and Japan and migrates to tropical Africa, Ceylon, and the Philippines. In North America from w. Alaska and n. Mackenzie east to Hudson Bay and w. Ontario and south to n. Illinois, Okla-

homa, and s. California. Breeds irregularly east to the Atlantic coast from Long Island to North Carolina and south to Texas. Winters from Long Island, s. Illinois, Arizona, and s. British Columbia south to the n. West Indies and Colombia and west to the Hawaiian Islands.

Wood Duck

Aix sponsa—#5
L. 18; W. 28; Wt. 1½ lbs.

IDENTIFICATION: The male's iridescent colors are not apparent at a distance, but the white lines on the face and sides are distinctive. The crest that gives it a big-headed appearance is absent in the summer eclipse plumage, but the small highly colored bill is a good character, as is the white eye patch of the female. In flight the white belly and long dark tail show up well and the bird keeps its head back and held high with bill pointed downward.



HABITS: This delicately proportioned and exquisitely colored duck is at home wherever there are trees and quiet fresh water. If not disturbed it is remarkably tame and fearless, even nesting in city parks. Were this species allowed to increase to the maximum number that the available habitat can accommodate it could undoubtedly become a common sight on almost every pond, stream, and swamp in the wooded sections of the country. Unfortunately, the 2 millions or so of our citizens who hunt ducks have not been willing to exempt from hunting even this one rather small species so that the 150 million of us who do not hunt can have it around in abundance where we can enjoy its beauty.

The wood duck is largely vegetarian. Only about 10 per

cent of its food consists of animal life, chiefly aquatic insects. The tiny floating plants, commonly known as duckweeds, that frequently cover a still woodland pond with a sheet of pale green are a favorite food. These ducks also eat seeds of trees and shrubs and often come out of water into the woods to get them. Acorns, hickory and beechnuts, and in the South cone scales of bald cypress are important foods. These they swallow whole and crush with ease in their powerful stomachs. Other foods are seeds of sedges, pondweeds, and grasses, especially wild rice, a favorite with all ducks.

VOICE: This noisy bird utters a variety of whistled notes that often sound like squeaks or squeals. A distinctive drawn-out squeal of alarm is usually given when the birds are flushed.

NEST: (I. 29, P.) The nest is generally located in a natural hollow in the trunk or rotted-out limb of an old tree. Less frequently an old woodpecker nest is utilized. Distance from water is not important, and the bird often seems to prefer the center to the edge of a patch of woods. Broken-down old apple trees are a favorite in some areas, and an old shade tree close to a house is not an uncommon site. The entrance is generally large, but a hole as small as that made by a flicker can be entered. The nest may be anywhere from a few feet to 50 feet above the ground, but in all cases the young apparently jump to earth without injury. There is no evidence that the female ever carries them down. An old nail keg or regular bird box measuring about 10 x 10 x 24 inches deep, with an entrance hole about 4 inches in diameter and 6 inches of sawdust and a drainage hole in the bottom, is often accepted when nest sites are scarce. The safest location is on a pole standing in water. Twelve white to buff-white eggs (2.0 x 1.5) are a normal clutch.

RANGE: (P. M.) Breeds from s. Nova Scotia, s.e. Ontario, s. Manitoba, and s. British Columbia south to Cuba, s. Texas, and s. California. Winters from s. Virginia, s. Illinois, and s. British Columbia south to Jamaica and c. Mexico.

Redhead

(American Pochard)

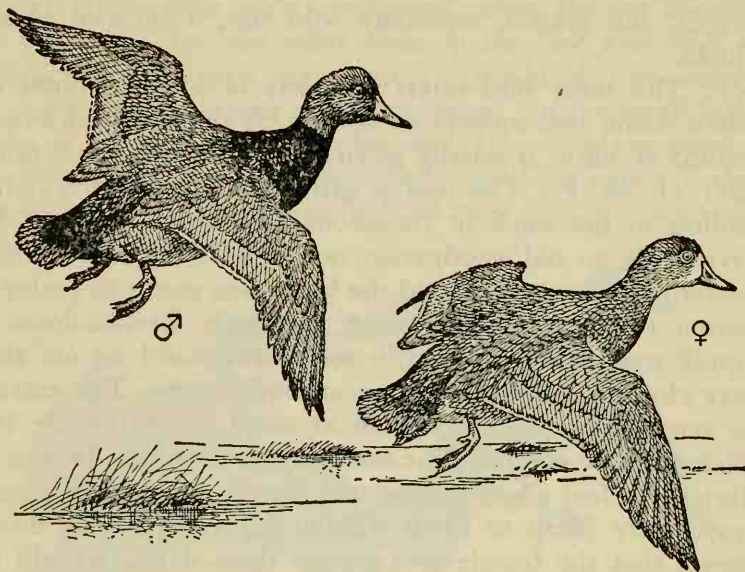
Aythya americana—~~8~~

L. 19½; W. 32; Wt. 2½ lbs.

IDENTIFICATION: The short, pale bluish bill, high forehead, compact build, black lower neck, and gray back of the male are distinctive. The uniformly brown female lacks positive characters besides those of shape, size, and bill. In flight the

speculum shows up as distinctly paler and grayer than the rest of the wing, especially in the female.

HABITS: (Age 12 yrs.) Few ducks have suffered such a decline in numbers as this, once the commonest of all diving ducks. The region where it formerly nested most abundantly is now the great wheat belt of the United States and Canada. It is also far too unsuspecting and inquisitive and its flocks too prone to return to their fallen companions. A late migrant,



it generally flies in irregular flocks by itself, though on water it associates with other diving ducks. During the day redheads gather in large rafts far out on lakes or coastal bays. Here, although they may seem to be resting quietly, small groups will suddenly take to the air and as suddenly settle back again. Much of their feeding is done in early morning or late evening, when they fly to shallows where they dive for food in water ranging up to 10 or 12 feet in depth. Along the coast their favorite haunts are the shallow fresh-water ponds that lie just back of the beaches. Insects and shellfish are taken, but the birds are essentially vegetarian. Leaves, stems, and seeds of pondweeds, musk grasses, shoal grasses, and smaller quantities of grass and sedge seeds are staple foods. Some of the best of the original feeding grounds of these and other diving ducks have been destroyed by the introduction of carp from Europe and the opening up of our coastal bays to salt tides through the cutting of canals and

the establishment of permanent inlets. Carp are very destructive to underwater plants like wild celery, which they uproot and eat, at the same time rilling the water so that sunlight cannot reach them to promote new growth. The best duck food plants of the shallow coastal bays grow most luxuriantly in brackish water and are killed when too much sea water is allowed to enter the bays.

VOICE: The male has a curious deep, vibrant note which has been likened to a cat's *meow* or a violin tone. The female has only a quacklike note.

NEST: (I. 24, P.) The usual nest site is in a dense bed of cat-tails or other reedlike growth in shallow water near open water. Occasionally it may be in a bed of phragmites on dry land near water. The nest is attached to reeds and built up out of the water on a base of matted vegetation. It is a well-made, often deep cup consisting of bits of reeds with a blanket of white down. The 12 eggs (2.4 x 1.7) in a normal clutch are pale creamy-buff.

RANGE: (P. M.) Breeds from s. Manitoba, c. Alberta, and s. British Columbia south to s. Wisconsin (occasionally east to w. Pennsylvania), c. Nebraska, n.w. New Mexico, and s. California. Winters from s. New England, the s. Great Lakes, s.e. Arizona, and s. British Columbia south to the West Indies and c.w. Mexico.

Ring-necked Duck

(American Tufted Duck)

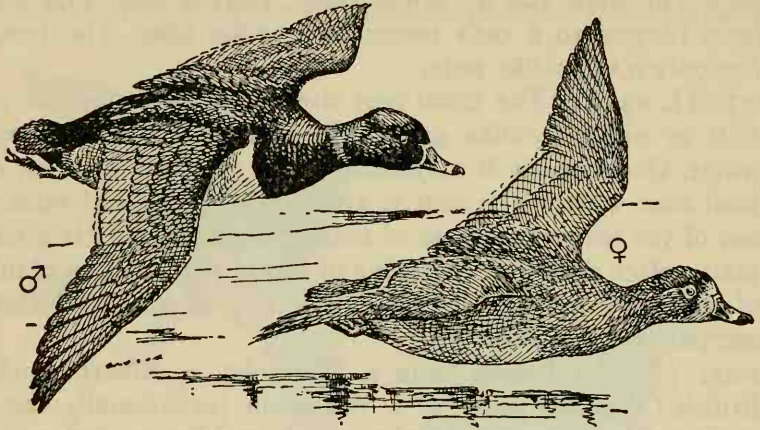
Aythya collaris—~~8~~

L. 17; W. 27; Wt. 1¾ lbs.

IDENTIFICATION: The dark back, puffy head, and vertical white wedge on the side just forward of the wing are the best field marks for the male, and the white eye ring for the brown female. In both sexes the bill has a distinctive light ring behind the black tip and another at the base. In flight the forward half of the wing appears dark like the back, in contrast to the paler grayish secondaries and brownish primaries.

HABITS: (Age 10 yrs.) Among hunters this duck is more commonly known as ring-bill. Once rare in the East, it is now increasing both as breeder and migrant. A mid-fall migrant, it frequents small swamp-bordered ponds and streams, often feeding along their shallow margins with coots and dabbling ducks and roosting out of the water in the branches of fallen treetops. Only in the South where shoal grass occurs do they frequent salt coastal waters. Ring-necks travel in small loose flocks of a dozen or so that alight in open water and later

swim into the shallows. They dive well and if necessary obtain food in deep water. Essentially vegetarian, they are fond of the seeds of water shield and other water lilies. Seeds and leaves of pondweeds and seeds of sedges, grasses, and smartweeds are eaten and, in small quantities, insects and snails.



VOICE: A seldom-heard purring note.

NEST: In the low marshy border of a pond or marsh slough; a bulky mass of vegetation that holds the eggs, in many cases, only a few inches above water. The average clutch is about 10 olive-buff eggs (2.2 x 1.6).

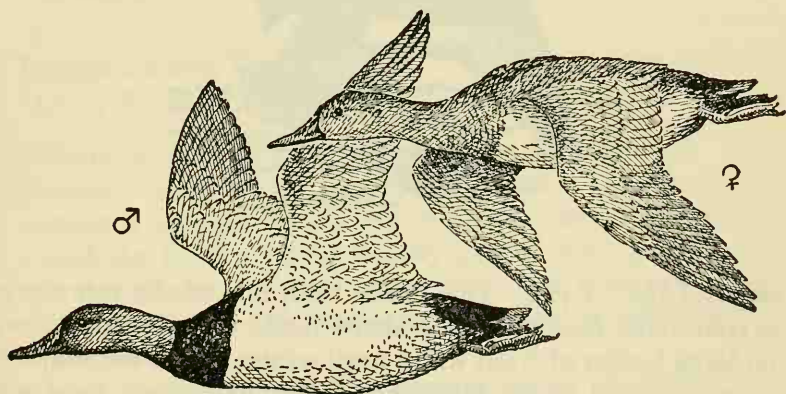
RANGE: (P. M.) Breeds in New Brunswick, n. Maine, w. Pennsylvania, and from w. Ontario, n. Saskatchewan, and c. British Columbia south to s. Wisconsin, n. Nebraska, and c. Arizona. Winters from s. New England, the Ohio Valley, n. Arkansas, and s. British Columbia south to the n. West Indies and Guatemala.

Canvasback

Aythya valisineria—~~8~~8
L. 21; W. 33; Wt. 3 lbs.

IDENTIFICATION: The long, broad-based bill that blends into the elongated head without a distinct break and, in flight, the long bill, head, neck, and the long pointed wings are distinctive. The pale, almost white back, the darkening on the face, and a neck that is reddish for its full length are the male's best field marks. The female has a back that is lighter and grayer than its uniformly dull brown head and neck.

HABITS: The canvasback is a big, fast-flying, wary duck that frequently winters as far north as fresh water stays open and returns in distinctive V-shaped flocks early in the spring. Although its breeding grounds extend somewhat farther north than the redhead's, it has suffered almost as severely from the drainage of the marshes and sloughs of the n. Great Plains. The most remarkable feature of its migration is the large number of birds that move almost due east to the Atlantic coast, the greatest winter concentrations occurring in the coastal bays of Virginia and North Carolina. Here they gather in enormous rafts far out from shore, carefully avoiding land areas even in flight, and often feeding in water 20 to 30 feet deep. Roots, tubers, and the basal portions of underwater plants are their chief foods, although they can live on shrimp and other shellfish and fish. Pondweeds and wild celery (*Vallisneria*), where it occurs, are staple items of diet. Tubers of such plants as *Sagittaria* and water lilies are also favorites. Many seeds of sedges and grasses, especially wild rice, are strained out of the bottom mud, which makes this species very vulnerable to lead poisoning. In heavily shot-over areas 10 per cent of the ducks may carry shot in their gizzards, as many as 96 shot having been found in a single bird.



VOICE: The male has a grunting note, also one that sounds like a *coo* or *moo*. The female has a quack.

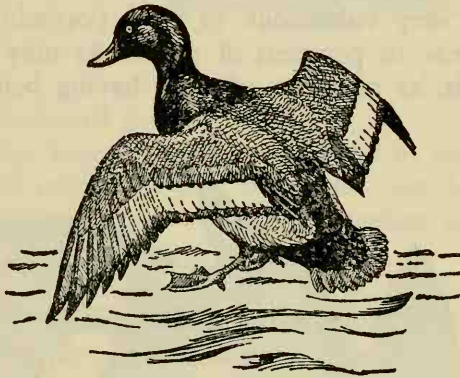
NEST: (I. 24, P.) In a bed of cattail or rushes growing in shallow water, generally not far from a deep-water opening. The nest of plant debris rests on the bottom or floats and is anchored to nearby stems. The 10 eggs (2.5 x 1.8) are gray-green.

RANGE: (M.) Breeds from s. Wisconsin, c. Manitoba, Great Slave Lake, n. Mackenzie, and c. Alaska south to c.w. Nebraska, n. New Mexico, w. Nevada, and c. Oregon. Winters from c. New York, s. Illinois, n. Colorado, n.w. Montana, and s. British Columbia south to the n. West Indies and Guatemala.

Scaup Duck
(Big Bluebill)

Aythya marila—#8
L. $17\frac{3}{4}$; W. $30\frac{1}{2}$; Wt. 2 lbs.

IDENTIFICATION: The uniformly pale bluish bill, solid dark head and neck of the male, and the sharply defined clear white area at the base of the bill of the female are good field characters. The male, besides being larger than the lesser scaup, has a thick neck and a squarish head with a green sheen, clearer white sides, and the white wing stripe extends well out beyond the speculum onto the inner primaries.



HABITS: (Age 13 yrs.) This hardy bird, one of the raft ducks, is commonly encountered in dense flocks well out from shore on large bodies of fresh water until winter, when the majority migrate to salt water. Here they gather in harbors, bays, and estuaries, traveling back and forth from one feeding ground to another in loosely bunched groups with one or more lines of stragglers trailing behind. Rafts of 50,000 or more have been reported from favorable feeding grounds. The birds dive to depths of at least 20 feet for food and, like all this group, use only their feet in swimming under water. Sewage outlets often draw them in large numbers, along with gulls and other scavengers.

The scaup is omnivorous, making out as well on vegetable as animal food. Commonly it fills up on any single readily available item. Inland its staples are pondweeds, musk grass, mare's-tail, and clams. Coastwise it takes wild celery, widgeon grass, and sea lettuce, but here its mainstay is shellfish of many kinds, and crabs, barnacles, and other crustacea.

VOICE: This usually silent duck utters a variety of low, purring notes when courting. Occasionally a flock breaks into a chorus of discordant *scaup* calls.

NEST: (I. 27, P.) In low moist tundra, generally near a small lake or pond. Often a definite colony is formed on an especially favorable island site. The nest of matted grasses is concealed in a clump of dense vegetation and may at times be well out in a marshy area. The 8 or 9 eggs (2.5 x 1.7) in a normal clutch vary from light to dark olive-buff.

RANGE: (M.) This circumpolar species breeds in both hemispheres from the Arctic Ocean south to about Lat. 60° N., but in North America it is absent from the region east of Hudson Bay, although there are casual breeding records east to the Magdalen Islands and south to s.e. Michigan, n. Iowa, and c. British Columbia. Winters from Maine, the Great Lakes, Colorado, and the Aleutians south to Florida, the Gulf Coast, and n. Lower California and in Eurasia.

Lesser Scaup Duck (Little Bluebill)

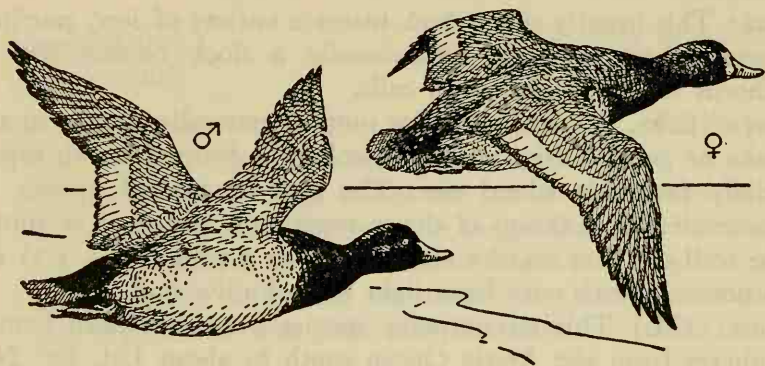
Aythya affinis—~~8~~
L. 17½; W. 27½; Wt. 1¾ lbs.

IDENTIFICATION: This duck can be distinguished from the scaup only under ideal conditions. The head of the male is higher-crowned and more elongated, the neck smaller, and the head coloring usually glossed with purple, although traces of green are not uncommon. The sides are grayer, and in both sexes the white in the wing is restricted to the speculum.

HABITS: (Age 10 yrs.) The lesser scaup or bluebill is the common diving duck of small lakes, ponds, and marshes. Here the birds are found in great rafts during migrations, and many winter in such areas. Large numbers, however, reach our southern coasts and become abundant on brackish bays and protected harbors and sounds. When traveling they move in fast-flying mass formations. If protected and fed, they become among the tamest of ducks. Most feeding is done in water not more than 5 or 6 feet deep, but the birds can dive:

at least 20 feet. Plant foods like pondweeds, widgeon grass, and the seeds of grasses and sedges and animal food in the form of snails of many types, aquatic insects, and shrimplike organisms, are about equally important in their diet.

VOICE: Whistled, purring, and scolding notes have been heard during courtship.



NEST: (I. 23, P.) Generally well hidden in tall grass on dry land, often some distance from the shallow pond, sluggish stream, or marsh channel that provides the pair with feeding ground and loafing spot during the courtship and laying period. When incubation starts, the drake, as in most ducks, deserts the hen and goes off to join other drakes on a large lake where it is safe during the molting period, when it is unable to fly. The nest is a depression in the ground, lined with feathers and grass. An average clutch is 11 dark olive-buff eggs (2.2 x 1.6).

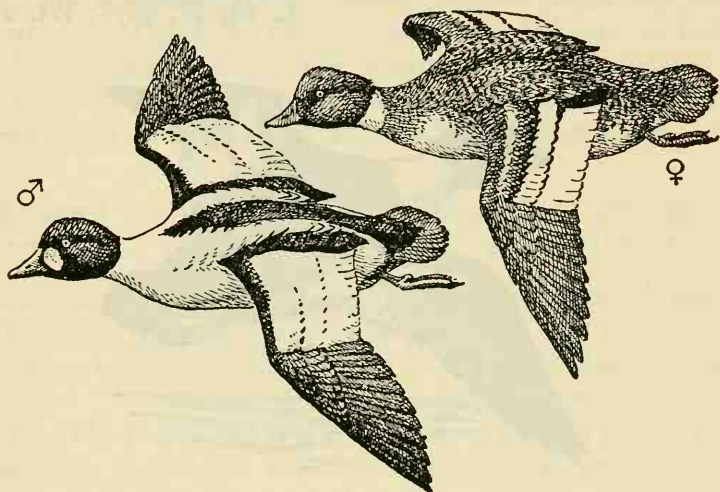
RANGE: (M.) Breeds from n.w. Mackenzie and w. Alaska south to Iowa, Montana, and s.e. British Columbia. Winters from Chesapeake Bay, s. Illinois, n.e. Colorado, and s. British Columbia south to Trinidad and Panama. Occurs on the Atlantic coast from Nova Scotia south in migration.

Goldeneye
(Whistler)

Bucephala clangula—♂9
L. 18; W. 28½; Wt. 2 lbs.

IDENTIFICATION: The male has a puffy, vertically elongated, somewhat peaked head and a sloping forehead. Its clear white sides and extensively white scapulars and wings make it very white-looking except for its dark head. The well-defined white neck and, in breeding season, the yellow-tipped bill are the female's most conspicuous features.

HABITS: This duck is commonly known as a "whistler" because of the loud, high-pitched whir of its wings, which produce a curiously resonant effect when a flock is on the move. During the non-breeding season this is a bird of large lakes, rivers, and, during midwinter, of coastal waters, where it feeds in small groups in protected harbors and bays or just beyond the ocean surf, flying out to sea at dusk to rest and sleep on the open ocean. Feeding is usually done in water less than 10 feet deep, with 20 feet about the maximum. Under water the bird propels itself with its feet only and obtains much of its food by overturning loose bottom stones. Goldeneyes prefer animal food—crayfish, aquatic insects, and shrimplike crustacea in fresh water, plus many kinds of seeds and tubers and the stems and leaves of pondweeds and wild celery. In salt water, crabs (especially mud crabs), mussels, and many snail-like organisms are eaten.



Most ducks have interesting courtship performances. That of the goldeneye, which is unusually spectacular, starts in February. After puffing up its head feathers the drake thrusts its head forward, then up, and finally throws it back to touch its tail. As the head is returned to its normal position with a quick jerk the bird suddenly spurts forward and reveals its brilliant orange feet.

VOICE: A variety of rather harsh, rasping, or vibrant notes.

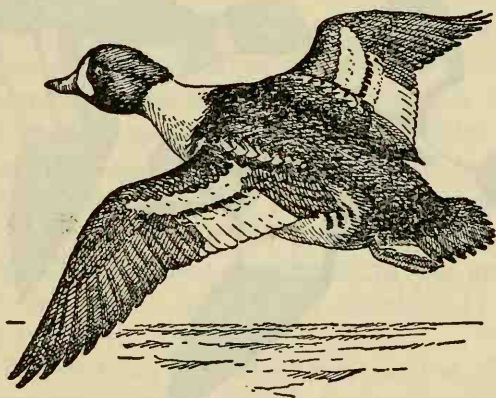
NEST: (I. 26, P., D. 60) In a natural cavity in a tree, generally close to, or over, water. An old woodpecker hole, nest box, or open hollow in the top of a broken trunk may be used. The entrance need not exceed 3 x 4½ inches but may be

from 5 to 60 feet aboveground. No nest material is used except down. A normal clutch is about 10 clear, pale green eggs (2.4 x 1.7). Like wood duck young, newly hatched goldeneye ducklings climb to the entrance hole, drop to the ground at a call from the female, and follow her to the nearest water.

RANGE: (P. M.) Breeds in the northern coniferous forests of the whole Northern Hemisphere south in North America to c. Maine, the Adirondacks, n. Michigan, n.w. Montana, and c. British Columbia but not on the Pacific coast; in Eurasia to Great Britain, Germany, the Balkans, and c. Siberia. Winters from Maine, the Great Lakes, and the Aleutian Islands south to Florida, the Gulf Coast, s. California, and in Eurasia to the Mediterranean, n. India, and s. China.

Barrow's Goldeneye

Bucephala islandica—♂9
L. 18; W. 28½; Wt. 2 lbs.



IDENTIFICATION: The male is much blacker than that of the preceding species. Its sides are broadly margined with black which extends almost to the water line forward of the wing. The scapulars show as a line of distinctly separated white spots, much as they do on a molting goldeneye, which is a much grayer bird. The horizontally elongated, evenly rounded head and the vertical or bulging forehead are safer field marks than the white crescent. The head shape is not so marked in the female, but her head is a darker, richer brown and her bill is all yellow in the breeding season.

HABITS: This duck differs little in habit from the goldeneye. It is not notably migratory, however, most individuals win-

tering rather close to their breeding grounds, and, where these do not freeze over, it seems to prefer fresh or brackish areas to salt water. Aquatic insects, crayfish, and other shrimplike crustacea and pondweeds are staple fresh-water foods; in salt water it appears to depend largely on mussels, periwinkles, crabs, and sea lettuce. On many salmon streams of the West its chief winter food is waste salmon eggs that float away from the spawning beds and the flesh of salmon that have died after spawning.

VOICE: Hoarse croaks and a vibrant mewing call.

NEST: (P.) In a hollow in a tree, usually near a pond or small lake, but at times up to half a mile from an especially favorable alkaline lake; in treeless country, cavities in or under rocks, in stream banks, or under dense bushy cover. The 10 eggs (2.4 x 1.7) are various shades of pale green.

RANGE: (P. M.) Breeds in Iceland, s.w. Greenland, Labrador, and the mountains of w. North America from s.c. Alaska south to s. Colorado and c. California. Winters in Iceland and Greenland south in the Atlantic to e. Long Island, and in the Pacific from s. Alaska to c. California. Also on open fresh water in the interior near its breeding grounds.

Bufflehead (Butterball)

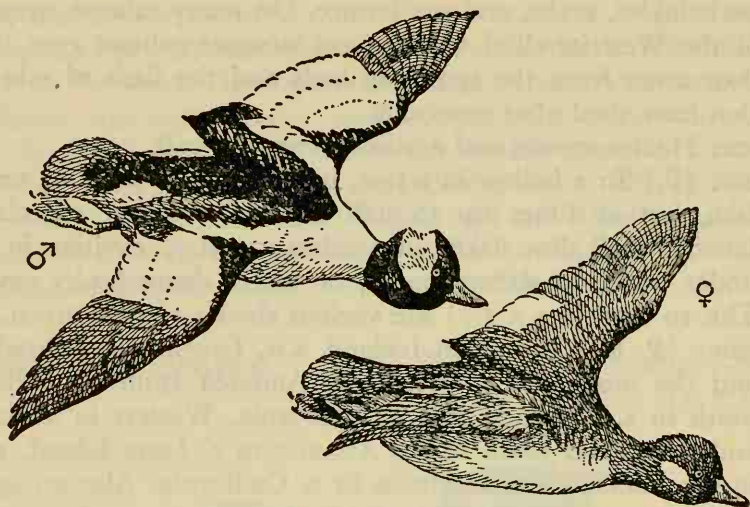
Bucephala albeola—~~9~~
L. 14; W. 22½; Wt. 1 lb.

IDENTIFICATION: The big head, tiny bill, and small size are diagnostic; in both sexes head markings are unique. Both have a white speculum, and in the male the wing coverts are white.

HABITS: The bufflehead is the smallest of the sea ducks. It is a fast flier, commonly traveling close to the water in small compact groups. In the fall it is generally very fat and is commonly called "butterball." Hunters find it easy to decoy. Although it occurs inland on large bodies of fresh water, in migration and early winter most buffleheads finally reach salt water. Here they feed singly or in small groups in shallow (4 to 15 feet) sandy bays, coming close inshore on a rising tide and often feeding in or just beyond the breaking surf. In fresh water they take shrimplike amphipods, aquatic insects, some snails and fish, and a few plant seeds. In salt water shrimp and other crustacea and shellfish, chiefly snails, are staple foods.

VOICE: The male has a squeaky whistle, the female a hoarse quack.

NEST: In a tree hollow generally close to a pond, usually in the old nest of a flicker or other woodpecker. The entrance may be no more than $3\frac{1}{4}$ inches in diameter and from 5 to 20 feet up. The 11 eggs (1.9×1.4) vary from pale yellow to pale olive-buff.



RANGE: (M.) Breeds from s. Quebec, n. Manitoba, n. Mackenzie, and c. Alaska south to s. Manitoba, n. Montana, and n. California. Winters from Maine, the Great Lakes, n.w. Montana, and the Aleutian Islands south to n. Florida, the Gulf Coast, c. Mexico, and Lower California.

Oldsquaw

(Long-tailed Duck)

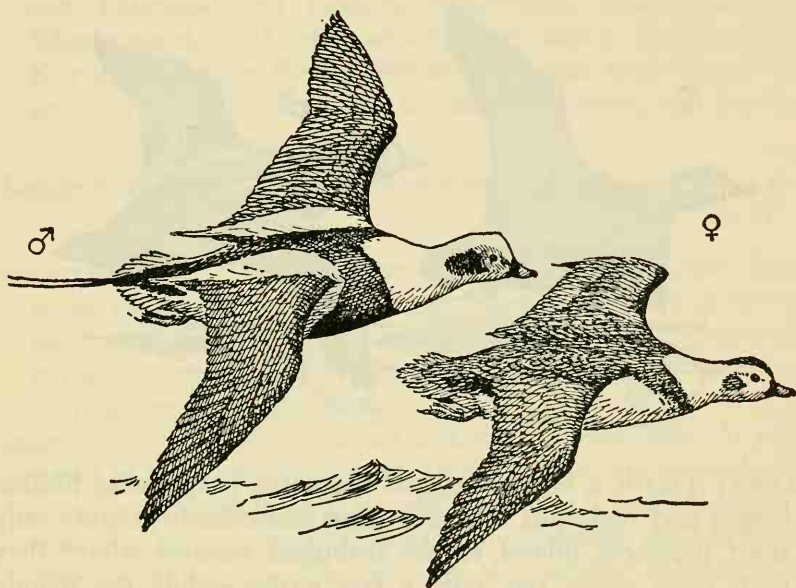
Clangula hyemalis—~~10~~

L. ♂ 21, ♀ 16; W. $28\frac{1}{2}$; Wt. $1\frac{1}{2}$ lbs.

IDENTIFICATION: This brown and extensively white duck is distinctively marked. On water it appears quite chunky, and the male holds its long tail well up in the air. In flight its long, pointed, solid-brown wings are in sharp contrast to the white on the body. The wings appear rather curved, and most of the deep wing stroke is below the horizontal.

HABITS: The oldsquaw is an abundant summer duck in coastal areas throughout the Arctic, where its nests provide Eskimos with eggs and a down almost as fine as eider. Some birds winter in arctic waters, but most come south to salt water in more temperate areas or on large bodies of open fresh water like the Great Lakes. At this season they are quite gregarious. In one area lake fishermen took 27,000 in their gill nets in a single spring. The birds swim under water with their wings

like surf and white-winged scoters and have occasionally been caught at the amazing depth of 200 feet. Along the coast they feed in tidal rips and offshore shoals but often resort to sheltered bays to spend the night. Here they are hunted along with other sea ducks despite the fact that they are tough and fishy. As spring nears they become increasingly noisy and active, courting males nearly mobbing certain favored females; from time to time the whole flock may indulge in an upflight that carries it nearly out of sight before it suddenly pitches back to the water. Unlike most ducks, the oldsquaw has distinct nuptial plumage in both sexes. The molt starts in February and in some individuals is completed by May; in others it never fully develops. Staple foods are crustacea like scuds and other amphipods, shrimp, and crabs; shellfish, chiefly blue mussels and snail-like species, and, in fresh water, pill clams; and at times small fish, plus a little plant material. They take aquatic insects to some extent, especially in summer.



VOICE: A noisy duck at all seasons; the distinctive melodious calls can at times be heard at least a mile. The general effect is not unlike the distant baying of a musical pack of hounds or *ow-ow-owdle-ow*.

NEST: (I. 24, P.) The usual site is a depression in a bed of sedge or under a dwarf willow near a shallow tundra pond or near salt water. The remarkably well-concealed nest is

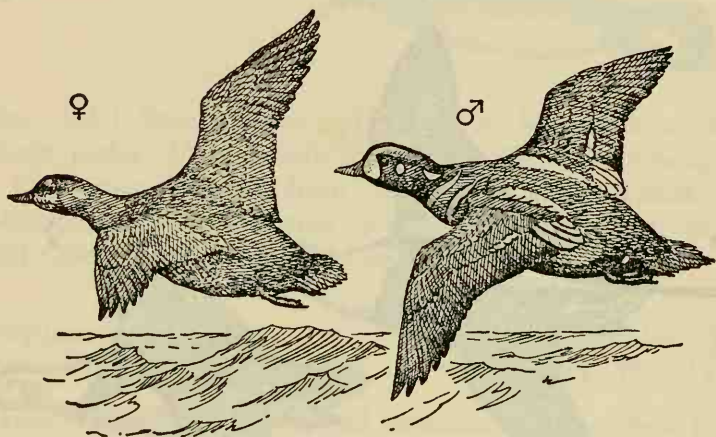
made of short bits of leaves which gradually mix with the down that is slowly added as incubation progresses. The 6 eggs (2.1 x 1.5) are olive-buff.

RANGE: (P. M.) Breeds on the Arctic coasts of both hemispheres south to Labrador, s. Hudson Bay, the Aleutians, Kamchatka, and s.c. Norway. Winters from s. Greenland and Bering Strait south to North Carolina, Washington, n. France, the Caspian Sea, and Japan. Occasionally n. Florida, the Gulf Coast, and s. California.

Harlequin Duck

Histrionicus histrionicus—~~10~~
L. 16¾; W. 25; Wt. 1¼ lbs.

IDENTIFICATION: The pattern of white on the often very dark male, together with the brown flanks, is distinctive. The female can be recognized by its small bill, plain wings, and the 3 light areas on the head.



HABITS: This is a bird of rugged seacoasts, frequenting hidden ledges and reefs just offshore. Most individuals migrate only short distances inland to the turbulent streams where they nest. Here males stay only a few weeks—while the female is laying her eggs—before they return to salt water to go through their eclipse molt and flightless period. Harlequins are usually encountered in groups of 6 or 8 that fly as a compact unit and often swim in regular formations abreast or in line. Occasionally they occur with oldsquaws but more often by themselves, feeding by day and roosting at night on isolated rocks.

On inland streams they move under water in the swift

currents with amazing ease and walk upstream on the bottom like ouzels. In such habitats their chief foods are nymphs of stoneflies, mayflies, and the larvae of caddis flies and other aquatic insects. At sea they feed primarily on the organisms that abound in rocky underwater areas. On sandy coasts they work around breakwaters or sunken wrecks. Staple salt-water foods are crabs, isopods, amphipods, and other crustacea, including barnacles and snails, limpets and chitons, which they seem to have no difficulty in dislodging from the rocks to which they cling. They take some sea urchins, starfish, and a few fish, chiefly sculpins.

VOICE: The female's shrill, whistlelike call of from 1 to 4 notes starts high and descends in pitch. That of the drake is lower and hoarser.

NEST: In a cavity among rocks or in a hollow under a bush near a swift-flowing stream. The 6 pale buff eggs (2.3 x 1.6) are laid in a sparse bed of grass and down.

RANGE: (P. M.) Breeds in Iceland, Greenland, Baffin Island, and Labrador and from n. Mackenzie, Alaska, and n.e. Siberia south to the mts. of Colorado and c. California, the Kuriles, and Lake Baikal. Winters from the breeding grounds south to e. Long Island, the c. California coast, and Japan.

Labrador Duck

Camptorhynchus labradorius—~~10~~
L. 19; W. 30

IDENTIFICATION: The handsome male was unmistakable. Specimens of the rather nondescript female and young show a narrow white speculum and a bill with a leathery spoonlike expansion at the end of the upper mandible and prominent vertical teeth on the lower.

HABITS: Little is known about this now extinct duck. It seems never to have been abundant. Its exact breeding grounds were never established, and its nest and eggs are unknown to science. Only 44 specimens exist in museums, the last having been taken in 1875. The chances of obtaining another in the wild are remote, but a few may still exist in attics or cupboards, the forgotten work of amateur taxidermists of the last century.

Like all ducks, the Labrador (or pied duck) was sold in the markets, but it was not very good eating and was never especially sought after. We do not know how much it suffered from eggers or from the feather-gathering expeditions that visited the Gulf of St. Lawrence region in the mid-eighteenth

century. We do know, however, that this type of exploitation during summer, when the birds were flightless, so reduced the bird population of that area that the trips eventually became unprofitable.

The structure of the Labrador's bill shows that it was adapted for sifting out small objects and suggests that the bird's feeding habits may have been unique among sea ducks. It was often called "sand shoal duck" because of its habit of feeding on sand bars and in sandy shallows, but it could also dive for food. The recorded diet is small shellfish, including mussels and small surf clams, but it must have taken seeds and other plant material, since it was reported to frequent brackish ponds of the coastal marsh, along with ducks like the gadwall.

Just what in its life history and behavior made it so vulnerable to the impact of civilization we do not know, but the conclusion that man played an important role in its rapid disappearance seems inescapable.

RANGE: (M.) Believed to have bred in Labrador. Wintered from Nova Scotia to the Chesapeake but was apparently most frequently seen in the waters off Long Island.

Eider

Somateria mollissima—~~II~~ I I

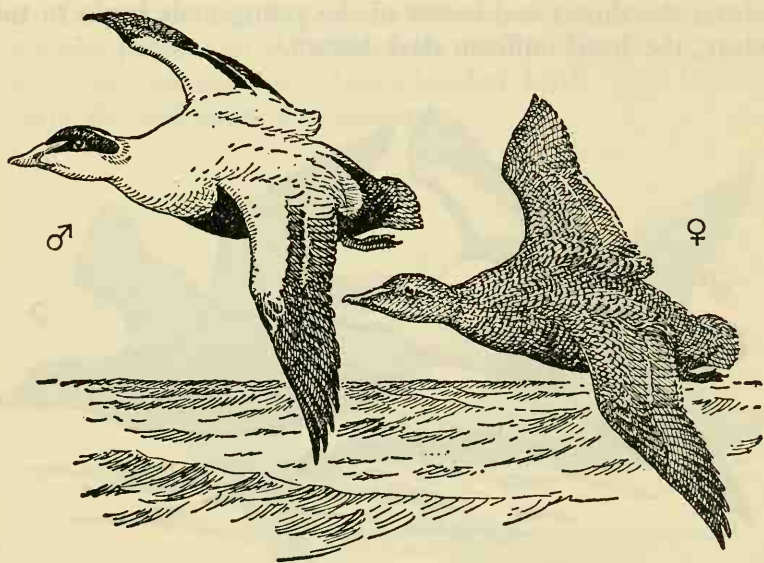
L. 24; W. 41; Wt. 4½ lbs.

IDENTIFICATION: The white-backed, black-sided males of this big, heavy duck are unmistakable. The rich brown, heavily barred female has a distinctive canvasback-like sloping profile. Young birds are dull brown with a well-defined broad light line over and behind the eye.

HABITS: This is one of the largest and hardiest of ducks. In the North its easily collected eggs are a valuable food that can be kept throughout the winter, while its down is an important article of commerce. One of the best heat-insulating materials known, the down is without equal in the manufacture of lightweight sleeping bags and arctic clothing. Unfortunately, in many regions the killing of both adults and young and the taking of whole clutches of eggs have decimated the population. As it is too fishy to be very good eating, it seems that it would be wise to give the bird full protection and harvest from a maximum population only the nest down and part of each clutch. There are a few places in Iceland, Norway, and Canada where this is being done with great success. Under protection and encouragement in the form of arti-

ficial nest sites, dense populations have been developed near settlements and the birds have become almost as tame as domestic fowl—a splendid example of the wise use of a natural resource; i.e., true conservation.

Most eiders seem not to migrate farther than necessary to find open water and feeding grounds. In flight they travel in long lines low over water with head low and bill tipped downward. The common blue mussel that occurs in dense beds on rocky and pebbly bottoms is a staple food, in many areas almost the only food; 185 have been found in a single stomach. Mussels and other shellfish up to 2 inches long are swallowed whole and broken up by the bird's powerful stomach. Crabs and other crustacea, sea urchins, and occasionally sculpins are common foods. Eiders seem to prefer to feed in fairly shallow water but if necessary can dive 35 feet. They feed by day, often most actively at low tide, and spend the night in rafts at sea or roosting in small groups on isolated rocks.



VOICE: The male's calls vary from pigeonlike coos to harsh, half-human moans. The female has a series of hoarse quacks.

NEST: (I. 28) On the ground in a depression in bare rocks or cliff ledges or hidden in a hollow among grass or shrubs. Generally near salt water and often in dense colonies on favorable rocky islands or headlands; in the Far North, along scattered ponds in low tundra near the coast. The nest has a

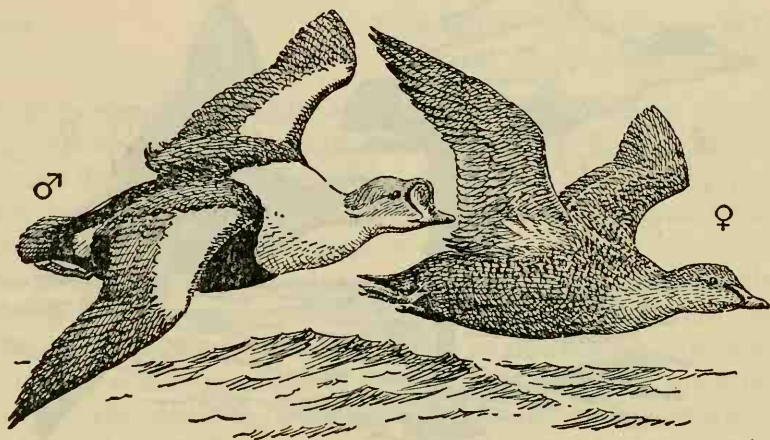
foundation of plant material and a thick lining of down, most, if not all, of which can be removed without reducing seriously the hatchability of the eggs. Down from 35 to 40 nests is required to produce 1 pound of commercial down. The 5 eggs (3 x 2) in an average clutch vary from olive to olive-buff.

RANGE: (P. M.) Breeds along the coast from the Kara Sea in n. Russia west through Arctic America to n.e. Siberia and south to Ireland, Maine, James Bay, and Kodiak Island. Winters south to n. France, e. Long Island, and s. Alaska.

King Eider

Somateria spectabilis—~~II~~ 11
L. 22; W. 36; Wt. 4 lbs.

IDENTIFICATION: The black-backed male is unmistakable. The female is a paler and redder brown than in the preceding species; it has a short bill and concave forehead and often a pale buffy chin and throat. Young are grayish-brown, paler below than above, but otherwise like the female. In early winter the throat and breast of the young male begin to turn white, the head uniform dark brown.



HABITS: This is an enormously abundant bird in parts of the Far North. Although it does not winter in great concentrations off the New England coast like the common eider, it occurs there regularly in small numbers. It is a great wanderer and, farther south and inland on fresh water, is by far the commoner of the two. Kings seem partial to reefs and ledges far offshore and can feed in deep water. Specimens have been caught in gill nets in the Great Lakes at depths of 150 feet.

They depend heavily on shellfish and crustacea, but the diet is notable for the sand dollars, sea urchins, sea cucumbers, sea squids, and fish it includes.

VOICE: The call of the male is a soft, dovelike, vibrant cooing, that of the female a grating croak.

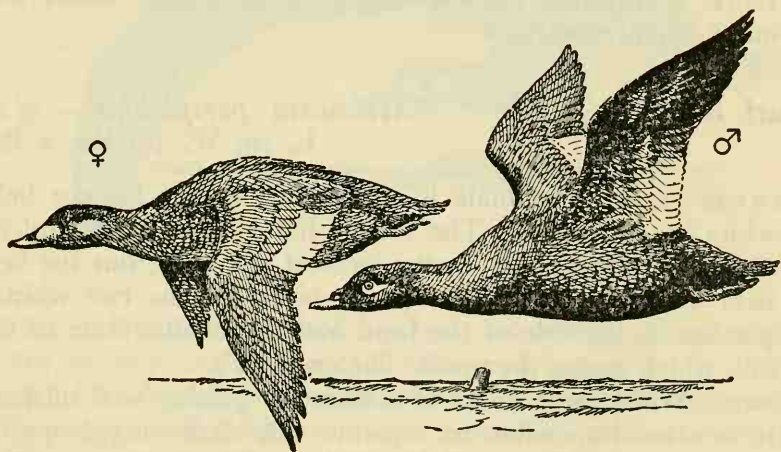
NEST: Widely scattered over open tundra well back from the coast and often some distance from water. Five olive-buff eggs (2.7×1.8) are a normal clutch.

RANGE: (P. M.) Breeds on the coasts and islands of the entire Arctic Ocean south to s. Greenland, n. Labrador, Bering Strait, and Spitsbergen. Winters from the limit of open water south to New Jersey, the Great Lakes, s. Alaska, and Denmark.

White-winged Scoter
(American Velvet Scoter)

Melanitta deglandi—#11.
L. 21; W. $37\frac{1}{2}$; Wt. $3\frac{1}{4}$ lbs.

IDENTIFICATION: In flight the white speculum identifies this species. The male has a black bill knob, a small white eye patch, and pinkish feet. Some females and most young show 2 white patches on the side of the head. This species and the next are short-necked, heavy-headed birds that habitually carry the bill pointed downward.



HABITS: In summer white-winged scoters breed over a vast area and seem equally at home on a prairie pond, woodland lake, or tundra. They feed on shellfish, crayfish, and other shrimp-like crustacea, aquatic insects, and pondweeds. During courtship in spring they engage in remarkable aerial maneuvers. In migrating overland they fly high in the air, stopping on

inland lakes and rivers. A few winter on the Great Lakes, but the chief wintering grounds are along the seacoast, where all 3 species of scoters are commonly known as "sea coots." Here they fly in long lines and loose bunches close to the water just offshore. They feed wherever shellfish beds are available at reasonable depths—15 to 20 feet—in the larger bays and sounds as well as on the offshore shoals and open beaches. Although the blue mussel is their staple food along the Atlantic coast, rock, surf, and razor clams, macomas, oysters, scallops, cockleshells, whelks, moon shells, slipper shells, and crabs of many kinds are taken in appreciable quantities and in sizes up to 2 or 2½ inches in length.

VOICE: The peculiar low, bell-like whistle or tinkling-ice sound attributed to these birds appears to be made with the wings. They also have a hoarse croak.

NEST: (I. 27, P.) In a hollow or crevice among rocks on high ground on an island or near water, generally well hidden under a shrub or in dense vegetation. The 8 eggs (2.6 x 1.8) are pinkish-buff.

RANGE: (M.) Breeds from Ungava and Alaska south to the Gulf of St. Lawrence, c. North Dakota, and n.e. Washington. Winters on the Atlantic coast from Newfoundland to South Carolina; on the Pacific coast from the Aleutian Islands to Lower California. Also sparingly on the Great Lakes and other inland waters.

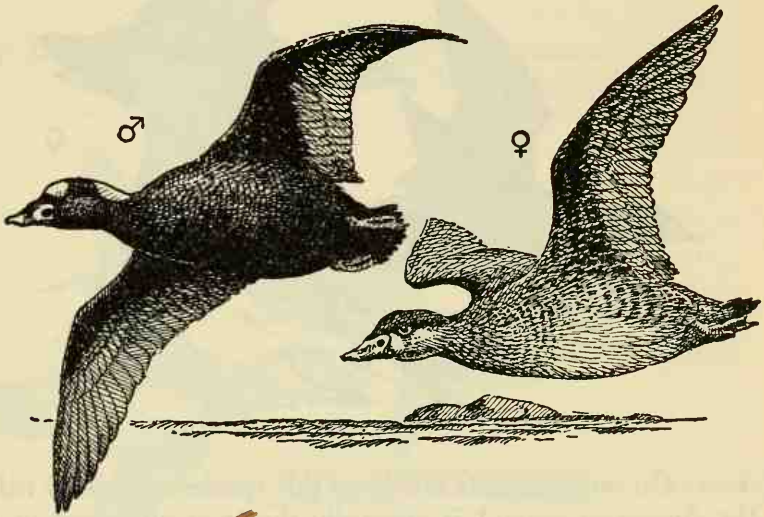
Surf Scoter

Melanitta perspicillata—~~11~~
L. 19; W. 32; Wt. 2 lbs

IDENTIFICATION: The male is solid black except for the bold white head markings. The female has a dark crown and an indistinct white patch on the back of the head, but the best field marks for it and for young birds are the two whitish patches on the side of the head and the swollen base to the bill, which makes the profile like an eider's.

HABITS: When great flocks of scoters are passing well offshore it is often impossible to separate this dark-winged species from the next although it is a lighter and often more active bird on the wing. However, upon alighting these have a characteristic habit of holding their wings extended upward until they coast to a stop. If near when they take off or land, a distinctive whistling of the wings can be noted. Although similar in habits to other scoters, these are more frequently observed in the surf close to the beaches where their manner

of swimming under water can often be seen through the clear front of a wave just before it breaks. Occasionally they come ashore to root about for food in wet sand. Their summer home is near fresh-water ponds and lakes in the interior, and though they occur in migration on the Great Lakes, they are rare inland at other seasons. They eat pondweeds, eelgrass, and miscellaneous seeds and berries, but aquatic insects are their mainstay in summer. On salt water they draw heavily on mussels, but macoma shells, surf and other clams, periwinkles, and small numbers of many other species, including a few fish, are eaten. Sand and mud crabs, sea urchins, sand dollars, and starfish sometimes furnish an entire meal for an individual bird. When swimming under water both surf and white-winged scoters use the stiffly extended inner wing and alula and carry the primaries folded back over the tail.



VOICE: A low guttural croak or cluck and a deep, clear whistle are the only recorded notes of this very silent bird.

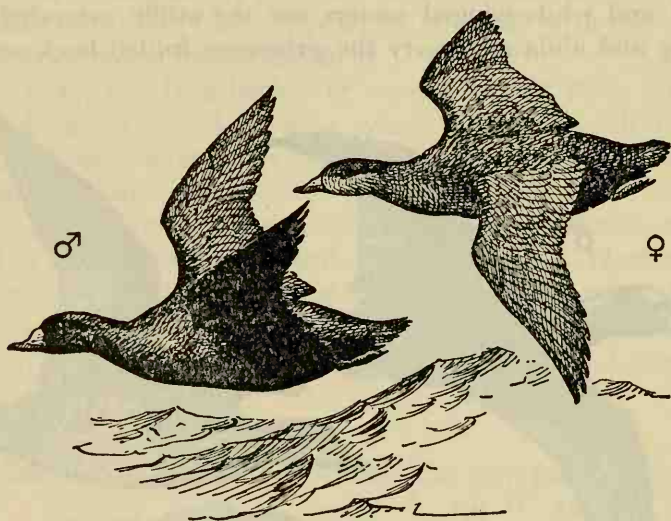
NEST: (P.) In a depression in the ground, lined with grass and down and well hidden in a clump of small trees or shrubs in the vicinity of a lake or, when in a marsh, a cup of dead marsh vegetation. The 7 eggs (2.4 x 1.7) are a very pale buff color.

RANGE: (M.) Breeds from Labrador to n.w. Alaska south to the Gulf of St. Lawrence, James Bay, and n. Alberta. Winters on the Atlantic coast from Nova Scotia to South Carolina and from the Aleutian Islands to Lower California.

Black Scoter
(Common Scoter)

Oidemia nigra—~~11~~ 11
L. 19; W. 32½; Wt. 2½ lbs.

IDENTIFICATION: On water these birds hold their heads high with the bills horizontal or slightly elevated; in flight the undersurfaces of the primaries show a silvery sheen. The male's distinctive characters are the yellow "butter-bill" and the black legs and feet. Females and young are dark-capped and have a more uniformly white face than surf scoters. Also, this bird has a longer, more pointed tail, which is often cocked up like a pintail's. Its high forehead and small bill make it look more like some of the river ducks.



HABITS: On our seacoasts in winter this species (formerly called the American scoter) is generally the least abundant of the "sea coots," and it is comparatively rare on inland waters during migration. It is the first to arrive in fall and often the last to go north in spring. Like all scoters, it leaves a few small flocks of non-breeders on the wintering grounds throughout the summer. A fast, active flier, it rises more readily from water than other scoters and flies about more. At times its wings produce a loud whistling sound. In salt water its staple food is the blue mussel, along with several species of clams, oysters, and other shellfish. Its high consumption of barnacles and limpets seems to confirm its reported fondness for feeding over outlying reefs and rocky ledges. In summer it is abundant in many coastal areas of

the Far North, nesting near salt water as well as inland near tundra ponds, but its habits and distribution at this season are imperfectly known.

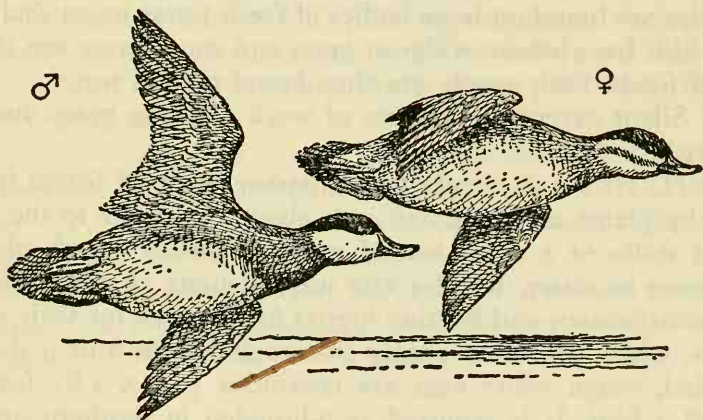
VOICE: The male has a melodious, almost bell-like whistle that suggests the call of a curlew, and a twittering call. The female makes only a harsh croak.

NEST: (I. 28, P.) Close to water, generally well hidden in a depression in the ground or in a cleft in rocks. The nest is lined with grasses and other vegetation and is usually under a shrub or in a tall clump of grass. The 6 eggs (2.4 x 1.6) are light buff.

RANGE: (M.) Breeds from Iceland, Newfoundland, Labrador, and James Bay west through Alaska and n. Asia to n. Europe south to Ireland. Winters from Newfoundland to North Carolina, the Aleutian Islands to s. California, and abroad to China and the Mediterranean.

Ruddy Duck

Oxyura jamaicensis—~~10~~
L. 15; W. 22½; Wt. 1¼ lbs.



IDENTIFICATION: This remarkable duck molts in September and again in April, the male exchanging its finely barred, brownish winter body plumage for a rich reddish-chestnut, and its bill becomes bright blue. In any plumage the black or dark brown cap and white cheeks (crossed by an indistinct horizontal line in the female) are conspicuous. The small size, chunky build, buzzy flight, and the male's habit of cocking up its expanded tail make it an easy duck to identify.

HABITS: The ruddy is grebelike in its ability to sink slowly out of sight under water, its inability to walk upright on land,

and its habit of diving rather than flying to escape pursuit. It takes off only with difficulty after a long run into the wind, travels low over the water with a rather erratic flight, and migrates largely at night. It seldom associates with any other birds except coots and as a rule occurs by ones or twos or in small groups of 8 or 12. The ruddy's tameness or stupidity, which makes it easy to shoot, probably accounts for part of its enormous decline in abundance. This is especially regrettable, as the readiness with which it establishes nesting colonies in suitable habitats far outside its normal breeding range indicates that with encouragement it might become a much more widespread nester on small ponds throughout the country. The male has a striking courtship performance and, unlike other ducks, stays with the female and assists in rearing the precocious young. The food of this little diving duck is three-quarters plant material. It eats a great many seeds, especially of sedges and pondweeds, as well as the leaves, stems, and tubers of sago and clasping-leaf pondweed. Soft-bodied aquatic insects, chiefly midge larvae, plus a few crustacea and shellfish, make up the rest of its diet. In winter ruddys are found on large bodies of fresh water or on shallow brackish bays, where widgeon grass and musk grass are their chief foods. Only rarely are they found on salt water.

VOICE: Silent except for a series of weak clucking notes during courtship.

NEST: (I. 21, P.) A closely woven basket made of leaves from nearby plants and anchored well above the water to the upright stalks of a dense bed of reeds or similar marsh plants growing in water. Ruddys also use old nests of other ducks, muskrat houses, and floating logs as foundations for their own nests, which are often poorly constructed. The 8 or 9 thick-shelled, rough white eggs are enormous (2.4×1.8) for so small a bird. It is reported as 2-brooded in southern areas. Many ducks occasionally deposit an egg in a nest other than their own, a habit in which the ruddy indulges quite frequently. A related South American species is completely parasitic.

RANGE: (P. M.) Breeds from Wisconsin, n. Manitoba, s. Mackenzie, and c. British Columbia south to c. Texas, n. Lower California, and throughout the West Indies. Isolated groups breed from Ungava and Cape Cod to s. Mexico and Guatemala. Winters from Chesapeake Bay, s. Illinois, c. Arizona, and n. British Columbia south through the West Indies and to Central America.

Masked Duck

Oxyura dominica—~~10~~
L. 13½; W. 20

IDENTIFICATION: The large white wing patch separates this duck from its close relative, the ruddy. On water the head markings of both sexes and the male's habit of erecting its tail are distinctive.

HABITS: This tropical relative of the ruddy duck makes its home in dense reed-grown marshes even when little or no open water is present. It also frequents mangrove swamps along the coast and makes itself at home in the smallest farm ponds. In such habitats it is often impossible to see or flush, and its presence is often never suspected, though it flies about more than the ruddy, especially in late evening and early morning, and seems more at ease on the wing. When disturbed it has the grebelike habit of sinking out of sight and, like the grebe, it seldom if ever leaves the water except for early morning and evening flights. It is somewhat migratory and a great wanderer, feeding by day on seeds, plants, and insects and traveling at night. The distribution of this duck as a breeder is as puzzling and erratic as that of the ruddy. It is common as close as Cuba and Jamaica and may well occur in our southern marshes more often than the lack of records indicate.

VOICE: In response to a loud noise calls back with a clucking described as *kirri-kirroo*, *kirri-kirroo*, *kirroo*, *kirrio*, *kirroo*.

NEST: (P.) In dense beds of reeds close to water. The 4 large eggs (2.5 x 1.8) are rough and whitish.

RANGE: (P. M.) Breeds from Cuba and Costa Rica south to n. Argentina and c. Chile. ~~Has wandered north as far as Vermont and Wisconsin.~~

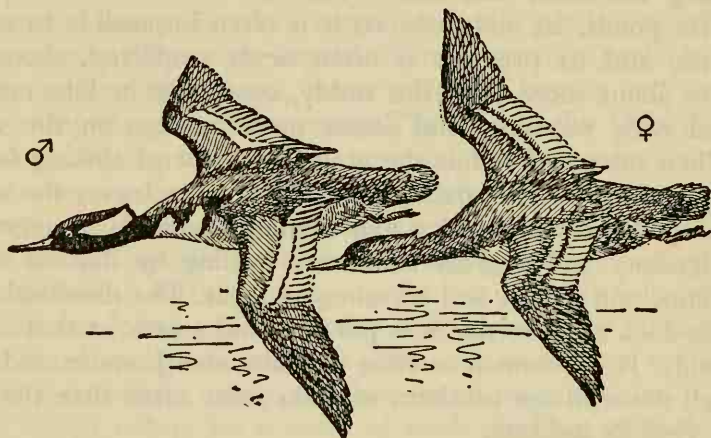
Hooded Merganser

Lophodytes cucullatus—~~9~~
L. 17½; W. 25; Wt. 1¼ lbs.

IDENTIFICATION: The black-bordered white area on the male's head, varying in size as the crest is raised and lowered, is distinctive, as are the black chest bars and brown sides. The gray females and young are best identified by their soft, loose crest of brownish feathers. Both sexes have partially white secondaries and inner wing coverts and a fine, round bill.

HABITS: The summer home is timbered stream bottoms, swamp forests, and woodland ponds and lakes. At other seasons almost any body of fresh water will serve. Along the coast the

birds frequent marsh ponds and occasionally salt creeks and inlets. On the wing they move fast with a direct flight and commonly travel in small, compact flocks. This duck's tame, unsuspicious character may account for the fact that it is now rather scarce in comparison with its former abundance. Its food is small fish, mostly species of no value to man, crayfish, aquatic insects, and frogs. Although it seems to prefer quiet waters, it is an expert diver and can feed with ease in the swift streams to which it is often driven when other areas freeze over.



VOICE: Low, grunting notes and a chattering sound.

NEST: (I. 31, P.) In a cavity of almost any type, sometimes far from water. Sites vary from holes in trees at any height, the broken top of a tree trunk, or a bird box to the inside of a hollow fallen log or on the ground in a hole under a stump. The 11 eggs (2.1 x 1.8) are pure white.

RANGE: (P. M.) Breeds from New Brunswick, n. Manitoba, s. Mackenzie, and s. Alaska south to c. Florida, Louisiana, Nebraska, Wyoming, and Oregon. Winters from Massachusetts, Michigan, Colorado, and British Columbia south to Cuba and s. Mexico.

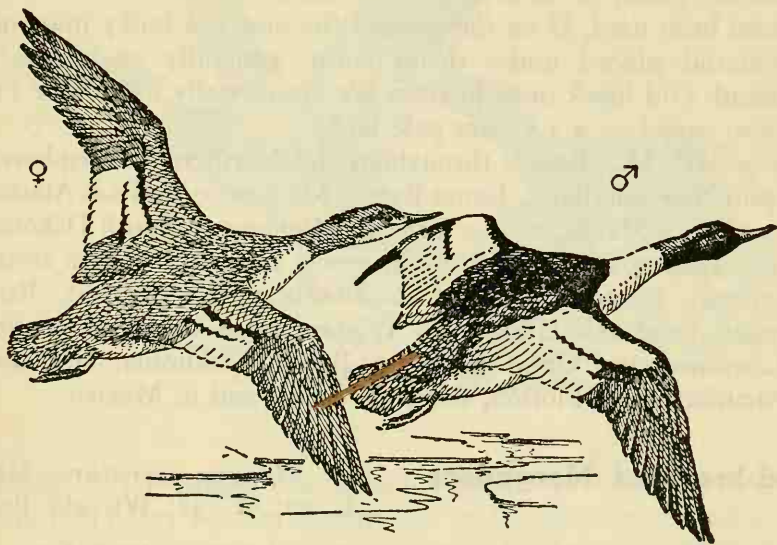
Merganser
(Goosander)

Mergus merganser—#9
L. 24; W. 36; Wt. 3 lbs.

IDENTIFICATION: The long, slim bill, head, and neck of both large mergansers are distinctive in flight and on water. The male of this species is very white-looking without any noticeable crest. The female has a bright, reddish head and neck with

a sharply defined white throat and line of juncture of the red-dish neck with the white chest, and a blue-gray body.

HABITS: This merganser is almost exclusively a fresh-water duck, seldom occurring in water saltier than brackish inlets and bays. It shows a definite preference for clear water in which, presumably, it can sight and pursue its prey more readily. Not markedly gregarious, it is usually encountered in flocks of 5 to 20 birds. Unlike the little hooded merganser that can jump into the air, these birds must run over the water quite a distance before they can take off. When feeding they swim with their heads under water to the eyes, diving as they locate food. This is chiefly fish, but on some waters considerable quantities of eels, crayfish, frogs, and aquatic insects are taken. Most of the fish run from 2 to 6 inches, with occasional individuals up to 15 inches.



There have been many conflicting opinions concerning the effect of mergansers on game and food fish. Fishery research now indicates that the main reason why fishing is so poor in many ponds and lakes is that the fish population is not being properly thinned. Warm-water fish like bass and perch are so prolific that, in the absence of sufficient predators, overcrowding and growth stagnation soon occur even in newly stocked ponds and reservoirs. In the typical lake from which most fish-eating birds and mammals have been eliminated there are often few "legal-size" fish, even when the over-all fish population in terms of pounds to the acre is very heavy. In

contrast, wilderness lakes, especially those known to be fished annually by flocks of migrant mergansers, usually provide excellent fishing, which indicates that the birds are holding the fish population below full carrying capacity, a state of affairs that promotes rapid growth in the survivors. Some kind of thinning is the only known way of producing good sport fishing for warm-water fish. Ordinarily mergansers seem not attracted by the best trout and salmon streams, as they prefer deeper waters with a greater variety of fish, most of which are slow swimmers and easier to catch. Only when the freezing of quiet waters forces the few that do not migrate onto swift streams are many trout taken.

VOICE: A hoarse croak and during courtship a series of purring notes.

NEST: (I. 34, P.) The preferred site is in a cavity in a tree, among rocks, or in a hole in a bank, but ruined buildings have been used. If on the ground the nest is a bulky mass of material placed under dense cover, generally on a small island. Old hawk nests in trees are occasionally used. The 11 or so eggs (2.5 x 1.8) are pale buff.

RANGE: (P. M.) Breeds throughout the Northern Hemisphere, from Newfoundland, James Bay, s. Mackenzie, and s.e. Alaska south to s. Maine, c. New York, c. Michigan, s. South Dakota, n.c. Arizona, and c. California; across Europe and Asia from Iceland, Scandinavia, and n. Siberia to Switzerland, Rumania, and the Himalayas. Winters from the Gulf of St. Lawrence, the Great Lakes, s. British Columbia, and the Aleutians to n. Florida, the Gulf Coast, and n. Mexico.

Red-breasted Merganser

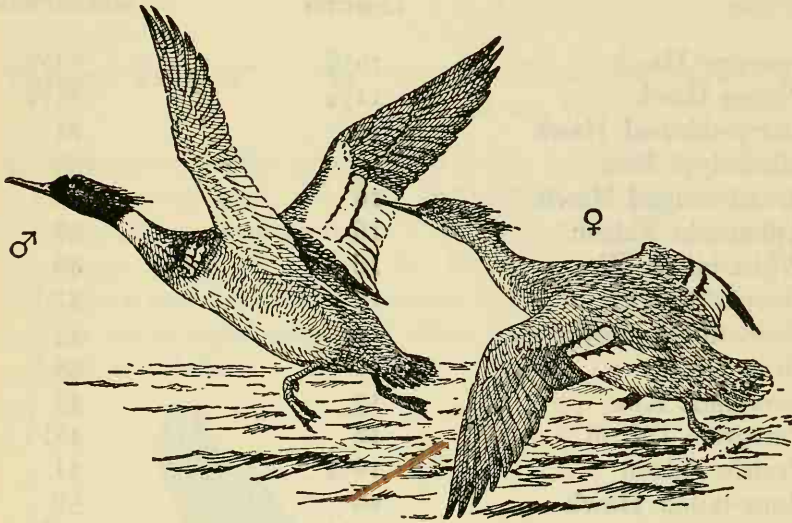
Mergus serrator—~~9~~

L. 22; W. 32; Wt. 2¼ lbs.

IDENTIFICATION: The conspicuous loose crest, reddish breast, and generally dark-bodied appearance of the male are distinctive. The female is more loose-crested, and the reddish color of its head and neck, paler than in the common merganser, blends into the white of its throat and breast. In flight the white patch on the wing shows a distinct division into 2 halves and the body appears brownish-gray.

HABITS: Most red-breasted mergansers winter on salt water. They are widely distributed, feeding off sandy shores just beyond the breakers, around inlets and river mouths, and in the creeks and channels of salt marshes. Some winter on the Great Lakes; others commonly appear on inland lakes and

ivers during migration. More gregarious than the merganser, these birds often occur in flocks of many hundreds, the members of which sometimes co-operate in feeding by forming a long line abreast and driving a school of fish into shallow areas, where they are more readily caught. The diet, although primarily fish, includes more crayfish and marine crustacea than with the preceding species. As the red-breasted always feeds in waters that support large populations of non-game fish, there is little likelihood of its ever taking any large proportion of commercially valuable species.



VOICE: A few hoarse croaks and a double purring note.

NEST: (I. 27, P.) On the ground under dense overhead cover or hidden under a log or in a pile of trash; found inland near rivers and ponds or along the shore, often on small offshore islands. The nest is little more than a down-filled depression. The 9 or so eggs (2.5 x 1.8) are olive-buff.

RANGE: (M.) Breeds north to the shores of the Arctic Ocean in w. North America, Europe, and Asia; occurs from c. Greenland, s. Baffin Island, s. Hudson Bay, n. Mackenzie, and n. Alaska south to Maine, n. New York, c. Michigan, s. Manitoba, and n. British Columbia; in Europe south to n. Germany and c. Russia. Winters from New Brunswick, the Great Lakes, and s.e. Alaska south to s. Florida, the Gulf Coast, and s. Lower California.

BIRDS of PREY

Order Falconiformes

Comparison of Average* Length and Wingspread of Birds of Prey

SPECIES	LENGTH	WINGSPREAD
Sparrow Hawk	10 $\frac{1}{4}$	22 $\frac{1}{2}$
Pigeon Hawk	11 $\frac{1}{2}$	25 $\frac{1}{2}$
Sharp-shinned Hawk	12	24
Mississippi Kite	14	35
Broad-winged Hawk	16	36
Aplomado Falcon	16	37
White-tailed Kite	16	40
Cooper's Hawk	17	31
Short-tailed Hawk	17	35
Gray Hawk	17	35
Everglade Kite	17	45
Peregrine Falcon	18	42 $\frac{1}{2}$
Prairie Falcon	18 $\frac{1}{2}$	41
Zone-tailed Hawk	20	50
Harris' Hawk	20 $\frac{1}{2}$	43 $\frac{1}{2}$
Marsh Hawk	20 $\frac{1}{2}$	45 $\frac{1}{2}$
Swainson's Hawk	20 $\frac{1}{2}$	50 $\frac{1}{2}$
Red-shouldered Hawk	21	42
Black Hawk	21	48
Rough-legged Hawk	21 $\frac{1}{2}$	52
Harlan's Hawk	21 $\frac{1}{2}$	52
Gyrfalcon	22	48
Red-tailed Hawk	22 $\frac{1}{2}$	50
Goshawk	23	44
Caracara	23	48
White-tailed Hawk	23	50
Osprey	23	68
Swallow-tailed Kite	24	48

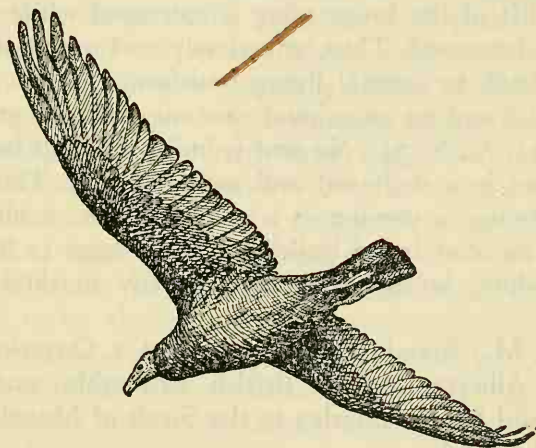
*These birds vary widely from average and females are generally much larger than males.

SPECIES	LENGTH	WINGSPREAD
Ferruginous Rough-legged Hawk	24	56
Black Vulture	25	57
Turkey Vulture	29	70
Bald Eagle	35	82
Golden Eagle	35½	83
Sea Eagle	36	88

VULTURES**Family Cathartidae****Turkey Vulture***

Cathartes aura—~~45~~
 L. 29; W. 70; Wt. 3½ lbs.

IDENTIFICATION: The small naked head, long narrow tail, and, in a soaring bird, the way the wings are held above the horizontal to form an open V are distinctive. The underwing pattern which is formed by the uniformly grayish flight feathers and the blackish coverts is a good field mark. Nestlings are covered with long white down. Young lack the red head of adults.



HABITS: Few birds are as conspicuous as these scavengers that spend most of the daylight hours patrolling the sky on the lookout for food. Lacking strong talons and therefore practically powerless to cause the death of any creature, they seek what fate provides, but they have amazing powers of sight and little escapes their notice. Each bird operates inde-

pendently, but by watching one another they learn of every find and gather for miles to share it. The heavy toll of small animal life along highways now provides a steady source of fresh food. Their supposed predilection for well-decayed carcasses appears to be due to their inability to tear up a large animal until decay has softened its tissues. In the South vultures constitute a useful sanitary brigade about city dumps. It has been found that the bacteria of some of the most virulent animal diseases, like hog cholera and anthrax, are destroyed by passing through their digestive system.

The secret of the turkey vulture's success is its ability to search a vast area with minimum effort. This it does by utilizing to the utmost the normal currents of the atmosphere, the most important of which are the thermals—rapidly rising columns of air that has been warmed by contact with the ground. This explains the vulture's practice of not leaving the communal roost (where upward of 100 or more may spend the night) until the sun has set the air in motion, and also its habit of soaring in circles to keep within the limits of a given thermal. Often a bird goes around and around within one of these invisible chimneys until it reaches the point where the cool upper air causes the moist thermal air to condense into a cloud. The vulture's way of holding its wings in an open V is another aid to effortless flight. When the bird tips to either side the lift of the lower wing is increased while that of the upper is decreased. Thus, effortlessly and automatically, it is brought back to normal flying position.

VOICE: A hiss and an occasional raucous grunt or growl.

NEST: (I. 41, A., N. 74) No nest is built, the eggs being laid on the ground in a sheltered and secluded spot. This may be a hollow stump, a crevice in a pile of rocks, a cliff ledge or cave, or an abandoned building. The 2 eggs (2.8 x 1.9) are creamy-white, boldly and often heavily marked with dark browns.

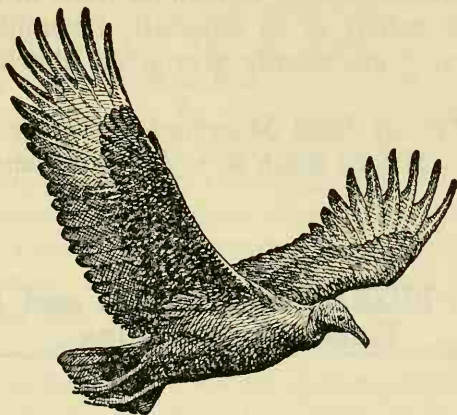
RANGE: (P. M.) Breeds from Connecticut, s. Ontario, n. Minnesota, c. Alberta, and s. British Columbia south through Mexico and South America to the Strait of Magellan and the Falkland Islands.

Black Vulture*

Coragyps atratus—~~45~~
L. 25; W. 57; Wt. 4½ lbs.

IDENTIFICATION: This vulture is feathered up the back of the neck to the black head. In the air it is much heavier-looking

than the preceding and has shorter, broader wings. The short, square tail (feet project to or beyond it) and the large white patches toward the ends of the wings, formed by the white bases to the primaries, are distinctive. Young birds are densely covered with rich buffy down.



HABITS: The non-migratory black vultures do not range into areas where in winter carcasses remain frozen for long periods. Along the coasts and about cities and slaughterhouses, where they become as tame as domestic fowl, these are more abundant than turkey vultures. They are very gregarious and are generally seen in flocks. At night they gather into large roosts which they sometimes share with turkey vultures. Blacks have not the great soaring ability of these relatives and often seem to depend upon them to locate food for them both. Blacks are heavier and more aggressive, and when a carcass is located they generally force the turkey vultures to wait their turn. Well-decayed carcasses, big enough to allow many birds to share the meal, seem to be the preferred food. Often a few blacks nest in a heron colony, where their normal role seems to be cleaning up the numerous young that fall from the nest or die from other causes, but at times when the adult herons leave eggs and helpless young unguarded the vultures become actual predators. Since vultures' feet are incapable of grasping anything, the birds carry their food by swallowing it and feed the young by regurgitation. In the air this vulture holds its wings almost horizontal and generally soars for only short intervals broken by a series of quick, deep flaps of its heavy broad wings. Other sources of food besides those already mentioned are dead fish along the shore and garbage in city dumps.

VOICE: Hissing sounds and muffled barking notes.

NEST: (I. 40, A., N. 70) The preferred site is a hollowed-out stump or broken-off tree trunk or a shallow cave on a cliff ledge, but often the eggs are laid on the ground in a dense thicket or under the shelter of a fallen tree trunk or in a hollow log. Gregariousness sometimes leads to the formation of a breeding colony at an especially favorable site. The 2 eggs (3.0 x 2.0) are usually gray-green blotched with dark brown.

RANGE: (R.) Occurs from Maryland, s. Indiana, Kansas, w. Texas, and e. Mexico south to s. Argentina and Chile.

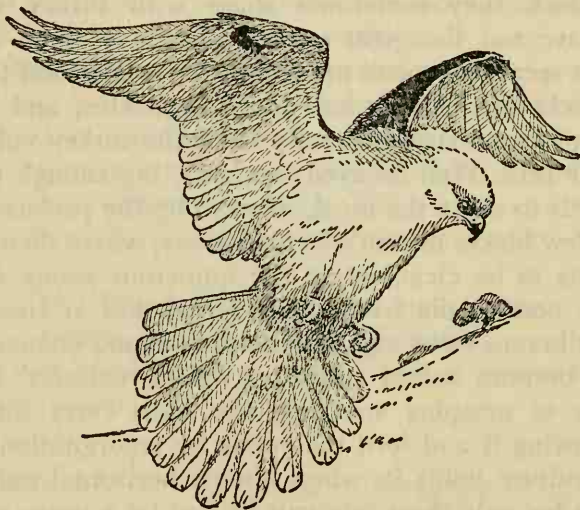
HAWKS, BUZZARDS, EAGLES, and ALLIES

Family Accipitridae

White-tailed Kite*

Elanus leucurus—#39
L. 16; W. 40

IDENTIFICATION: The gull-like whiteness of the adult and the black patches at the bend of the wing—a large one above and a small one below—are distinctive. In addition, the rather brownish young have a dark subterminal tail band.



HABITS: This widely distributed Central and South American bird formerly ranged into 3 areas in the United States, but it is apparently gone now from all but s. Texas and California.

Open, grassy country, especially damp meadows, alfalfa fields, or fresh-water marshes with scattered clumps of trees for roosting and nesting, seems to be the ideal habitat. Here the birds beat slowly back and forth at a moderate height, looking for food. In the air their appearance is very distinctive as the long, pointed wings, although held upward, are so curved that the tips point downward. They also have a habit of dangling their feet in flight, and when prey is sighted they often hover in one spot for some seconds before pouncing or going on. In California, where their feeding habits have been studied, their food seems to be exclusively small mammals, especially the meadow mouse. As this mouse is one of those species whose local populations commonly build up to a peak every 4 years and are then drastically reduced by disease, kites are apt to have to look for new feeding grounds from year to year.

VOICE: Various whistled notes, singly or in series, some drawn out and plaintive, others abrupt and osprey-like.

NEST: (I. 30, A., N. 30) In a tree from 12 to 60 feet above-ground, usually along a stream bank or on the edge of a fresh-water marsh. The nest is a substantial mass of loose twigs with a central cup lined with fine material. The 4 or 5 eggs (1.7 x 1.3) are white, heavily marked with various shades of brown. Two broods are sometimes reared.

RANGE: (R.) Occurred originally from South Carolina south through Florida; s.c. Oklahoma south through c. Texas; and n. California south; through South America to n. Argentina and c. Chile. Now greatly reduced throughout its United States range.

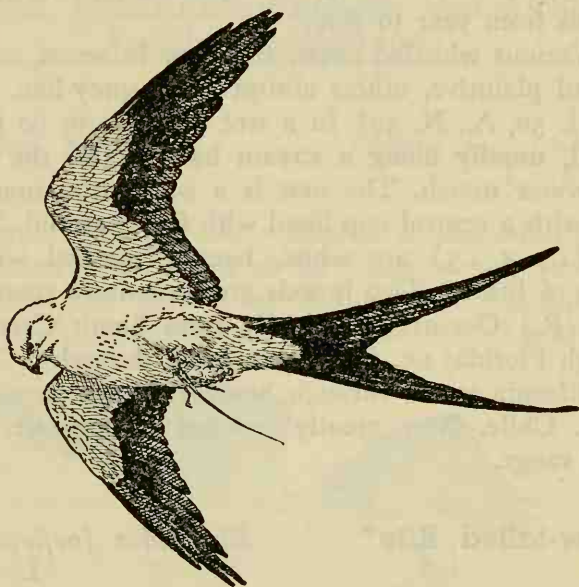
Swallow-tailed Kite*

Elanoides forficatus—~~39~~
L. 24; W. 48

IDENTIFICATION: This bird could be confused only with a young frigate-bird, from which it differs most strikingly in having white underwing coverts. Young kites can be recognized by the white spots in the dark parts of their plumage.

HABITS: Nothing in all nature is more exquisitely beautiful than the flight of this bird, and its disappearance from its once extensive United States range, except for a few areas on the South Atlantic and Gulf coasts, is a real tragedy. Watching them soaring high in the air one minute with a buoyancy that defies gravity, then swooping to within a few feet of the ground with a power and grace that reveal absolute mastery

of the air, one can only marvel at the effortlessness of the whole performance. River bottoms, swamp forests, fresh-water marshes, and the vicinity of ponds and lakes are favorite haunts, but the birds also feed over adjacent open farmlands. The swallow-tail is quite gregarious, often hunting in small groups and migrating in large flocks. Lizards, tree frogs, and snakes plucked from trees or the ground and large insects like dragonflies captured in flight are staple foods. Much of its prey is eaten while the bird is in the air, and it drinks and bathes by skimming the water like a swallow. Probably the drainage of marshes and the cutting of swamp forests have played a large part in its decline in the United States, although wanton shooting as a living target has also been a factor.



VOICE: A series of squealing or whistled notes, sometimes loud and shrill and at other times soft and plaintive.

NEST: (A.) Well out in the upper branches of a very tall tree, seldom lower than 60 feet and usually well over 100 feet. Twigs and small branches to which some kind of tree "moss" is attached seem to be the only acceptable nesting material. The center cup of the rather flat, not too substantial nest is finished off with a lining of moss. The 2 or 3 eggs (1.8 x 1.5) are white blotched with brown.

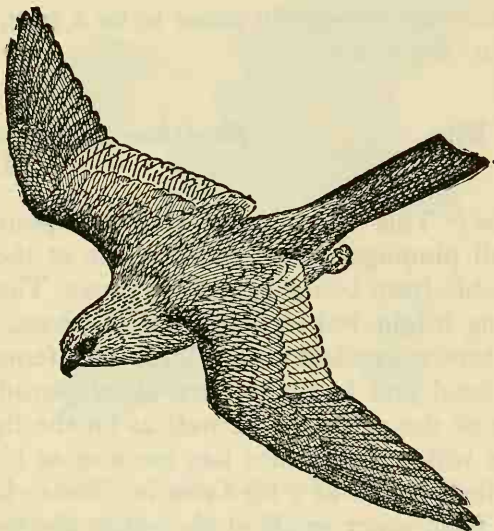
RANGE: (P. M.) Once bred from North Carolina, s. Ohio, s. Wisconsin, n. Minnesota, and e. Nebraska south to Florida

and the Gulf Coast, west to e. Texas, and south through Central and e. South America to n. Argentina. Now seldom found north of c. Florida and a few points along the Gulf Coast. Winters s. of the United States.

Mississippi Kite*

Ictinia mississippiensis—#39
L. 14; W. 35

IDENTIFICATION: The pale head and black tail of adults are distinctive, and in flight the way the rear edge of the wing gradually becomes paler toward the body. Young with their brown streaks look very different and show 3 grayish bands on the tail.



HABITS: In the western part of its range this kite feeds over open scrub oak and range land. Here it nests in the few scattered small trees or in the taller groves along creek bottoms. Farther east it nests in tall timber on the borders of lakes and rivers and does most of its feeding over adjacent plantations. It also seems at home in open pine forests, where it nests in the tallest trees. The birds are quite gregarious, gathering in flocks on favorable feeding grounds and during migration, and in some cases forming loose nesting colonies. Like other kites, the Mississippi has a wonderfully buoyant flight and is very active in the air, constantly changing the position of its long, square black tail as it veers hither and thither. With hardly a movement of its wings it suddenly rises high in the sky and as suddenly dips back to earth. One of its characteristic habits is to check its flight abruptly and

hang motionless in the sky with wings horizontal and body tipped. Its only known foods are large insects, especially cicadas, grasshoppers, and dragonflies.

VOICE: A thin, high, osprey-like double whistle.

NEST: (I. 30, A.) In the top of a tree, which in some areas means 100 feet or more but in the West may mean only 6 to 12 feet. The nest is generally a flimsy, flat-topped structure made of coarse twigs and is invariably well lined with fresh green leaves. The 2 eggs (1.6 x 1.3) are bluish-white and unmarked.

RANGE: (M.) Breeds from South Carolina, Tennessee, and s. Kansas south to n. Florida, the Gulf Coast, and w. Texas. Winters from s. Florida and s. Texas south. A similar bird, of which this may eventually prove to be a race, occurs from Mexico to n. Argentina.

Everglade Kite

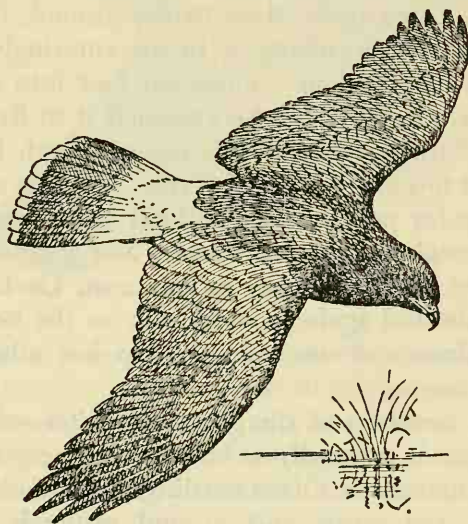
Rostrhamus sociabilis—#39
L. 17; W. 45

IDENTIFICATION: This is a broad-winged, square-tailed bird which in all plumages shows much white at the base of the tail, noticeable from below as well as above. The black male, with its long bright red legs and red bill base, is unmistakable. The brown-streaked young birds and females are light about the head and in flight often show considerable white at the base of the primaries as well as on the tip of the tail.

HABITS: This wide-ranging kite has become as highly specialized in its food habits as a bird can be. Today it feeds solely on the big fresh-water snails of the genus *Ampullaria*, which live in fresh-water marshes throughout the Tropics and lay their eggs in conspicuous masses a few inches above the water, on the stems of marsh plants. Most of the kite's feeding is done in the cool early morning or late afternoon, when the snails come up out of the water. Kites hunt by flapping along slowly and rather heavily just over the tops of the marsh grasses. Their bills are pointed downward, their broad tails constantly in use, and when a snail is sighted the bird often hovers for a few seconds before dropping upon it. Once captured, the snail is carried to a regular feeding perch and extracted from the unbroken shell with the long, strongly hooked bill which is so well adapted to this purpose. Soaring seems to be a pastime, and during the heat of the day the birds often ride the thermals for hours.

Once common in Florida, this kite has almost disappeared

with the digging of drainage canals without proper locks to control the amount of water drawn off. Many marshes now dry out completely during drought years. This exterminates the snails, and although the marsh soon looks as flourishing as ever when the rains fill it up again, the snails and kites are generally gone forever. A few kites still inhabit the shore of undrainable Lake Okeechobee, but here they are rapidly falling victims to the type of thoughtless duck hunter who shoots any hawklike bird that flies past his blind.



VOICE: A rapid series of high-pitched, squeaky notes that produce a weak chatter or cackle.

NEST: (A.) Often in small colonies of a few to a dozen or more pairs. The usual site is a few feet above the water in an isolated clump of willows or other marsh trees well out in a marshy area, but the birds also build directly on a matted down patch of marsh reeds. The 3 or 4 eggs (1.7 x 1.4) are white, profusely covered with brown markings.

RANGE: (R.) Occurs from n. Florida and e. Mexico south to w. Cuba and through Central and South America to n. Argentina.

Goshawk*

Accipiter gentilis—#40
♂ L. 21; W. 42; ♀ L. 25; W. 46

IDENTIFICATION: The uniformly slate-gray appearance of adults is distinctive. Young birds resemble those of the next 2 species

but have a more pronounced light eye stripe and in flight seem proportionately much heavier about the head and neck.

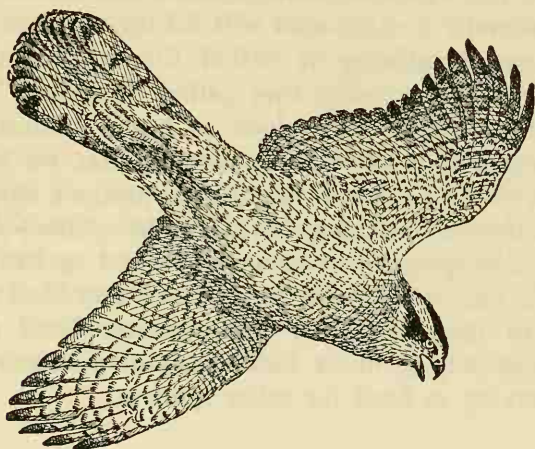
HABITS: This bird of the northern woodlands prefers mixed growths for nesting, usually selecting a remote, secluded stand of heavy timber. Much of its hunting is done about clearings and brushy openings. It seems to migrate only when forced to by lack of food and does not appear south of its breeding grounds in large numbers except during "flight years," which generally occur at regular 9- to 11-year intervals. When hunting, the goshawk flies through the woods below the treetops, often quite close to the ground, first surprising its prey and then catching it in an amazingly swift direct pursuit that may end in a chase on foot into a thicket. Because of this, medieval hawkers trained it to fly from the fist directly at flushed game. For a resting perch it chooses the inside of the top of a well-leaved tree, where it can search the surroundings for prey and see without being seen. At the nest goshawks reveal an utter fearlessness and a savage determination to drive intruders away at any cost. Cackling defiance, they try again and again to strike one on the head with their powerful talons and one cannot help but admire such devotion and courage.

Although members of the genus *Accipiter*—the true hawks—are thought of primarily as bird eaters, the goshawk takes a great many mammals. Often nestlings are fed on nothing else. Chipmunks, red, gray, and ground squirrels, rabbits, and even weasels are common prey; occasionally mice and, in the Far North, lemmings. The goshawk can handle and seems partial to large ground-dwelling birds like grouse, ptarmigan, quail, and ducks but at times will take sparrows. It often learns to avail itself of the tempting food supply offered by a poultry yard or game farm and seldom leaves the owner any choice but to shoot it. Among wild birds its toll appears never to exceed what nature can replace during the following breeding season, since birds like ruffed grouse continue to be common, even abundant, in areas where the goshawk is a regular breeder.

VOICE: A fierce, deep-toned, staccato *ca, ca, ca, ca, ca, ca, ca* uttered as an alarm note about the nest. The normal courtship call is a clear, high-pitched, and rather plaintive *hi-aa, hi-aa* that suggests a red-shouldered hawk's call.

NEST: (I. 37, A., N. 42) The huge, bulky nest, often 3 to 5 feet across, is generally supported by horizontal branches against the main trunk of a deciduous tree some 20 to 60

feet up. It is made of long sticks with a lining of bark and decorated with a few fresh sprigs of evergreen foliage. The 3 or 4 unmarked eggs (2.3 x 1.8) are bluish-white.



RANGE: (P. M.) Breeds through most of Europe and Asia and in North America from Newfoundland, Ungava, n. Manitoba, n.w. Mackenzie, and n.w. Alaska south to n. New England (Maryland in the mts.), n. Michigan, n. Minnesota, and n. Mexico. Winters from s. Canada and Alaska south to Virginia, Illinois, Oklahoma, and n. Mexico.

Sharp-shinned Hawk*

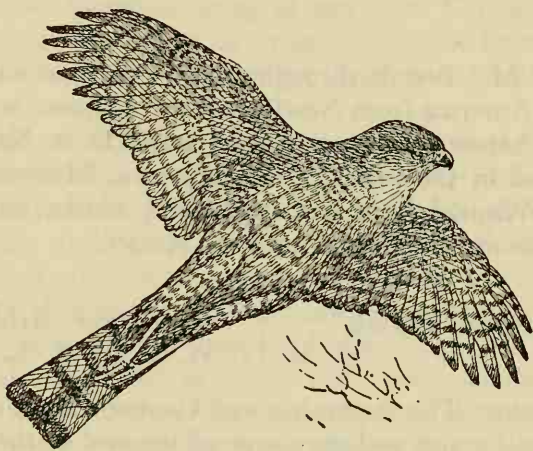
Accipiter striatus—#40
♂ L. 11; W. 21½; ♀ L. 13; W. 26

IDENTIFICATION: The sharp-shin and Cooper's are almost identical except for size and the shape of the end of the folded tail—square in this species, rounded in Cooper's. The much larger size of the females, which is characteristic of all hawks, results in a size overlap between large female sharp-shins and small male Cooper's.

HABITS: The little sharp-shin is a woodland species that usually selects a clump of conifers near a road or other opening for nesting. It does not thrive around settled areas and generally becomes scarce as extensive forests disappear. The center of its abundance is now the great woodlands of e. Canada, from which a flood of migrants sweeps south each fall along certain well-defined hawk flyways where hundreds can be seen on favorable days.

This hawk's hunting methods are like those of other Accipiters, but its prey is smaller. Sparrows and warblers supply much of its food, although it can on occasion handle bobwhites, pigeons, and half-grown chickens. Mammals from the size of red squirrels down to mice and shrews are taken, and occasionally a sharp-shin will fill up on large insects.

Years ago ornithologists called this a "harmful" hawk because it preyed on what they called "beneficial" songbirds. Now that ecologists have given us better understanding of the inner workings of wildlife communities we realize that songbirds, like all other living things, produce surpluses that can be harvested without affecting the year-to-year breeding stock. No species can be termed good or bad. Each has its place in one of the many food chains that bind all wildlife together in interdependent communities. Each community can support only so many individuals of a certain kind; the surplus serving as food for other species.



VOICE: The alarm note about the nest is a series of shrill *kik*, *kik*, *kik*, *kik* notes run together into an angry cackle. The call note is a thin, plaintive squeal or whine.

NEST: (A.) A flat, shallow structure of woven twigs so large that the sitting bird is usually hidden from below. Placed from 10 to 60 feet up on horizontal limbs against the trunk of a tree, usually a conifer. Occasionally the nest is in a crevice in a cliff or in a hollow in the trunk of a large tree. Unlike many birds of prey, these normally build a new nest every year, though occasionally they use the old nests of other birds. The 4 eggs (1.5 x 1.2) are white, blotched with browns.

RANGE: (P. M.) Breeds from Newfoundland, c. Quebec, n. Manitoba, s. Mackenzie, and c. Alaska south to n. Florida (and the Greater Antilles), the Gulf Coast, and n. Mexico. Winters from c. New England, Ohio, n. Nebraska, w. Montana, and s.e. Alaska south to Guatemala.

Cooper's Hawk*

Accipiter cooperii—~~40~~
♂ L. 16; W. 28; ♀ L. 18; W. 33

IDENTIFICATION: Distinguishable from the sharp-shin only by its size and the rounded end of its closed tail. All Accipiters are readily separated from Buteos and falcons by their short, rounded wings and long tails and in flight by their habit of alternately flapping 4 or 5 times and then gliding a few seconds. This they do even on those rare occasions, chiefly during migration or courtship, when they soar high in the air.



HABITS: Apparently Cooper's and sharp-shin hawks occupy niches so similar that they will not tolerate each other's presence in the same area. The cutting up of forests into scattered wood lots interspersed by open farmland has so favored Cooper's that it is today one of the commonest birds of prey. It is seldom seen, however, as it has the Accipiter habit of perching in the dense, leafy crown of a tree and flying close to the ground through woods and thickets. Built for maneuverability, with a long rudderlike tail, it has no trouble following every twist and turn of a fleeing bird or dashing headlong through the thickest woods. It lives on birds of dove, quail, robin, meadowlark, and jay size as well as on smaller ones and small mammals. Many a farmer

blames his chicken losses on the larger, more conspicuous Buteos when this hawk is the culprit. However, not every Cooper's is a "chicken hawk." Many reliable accounts of pairs that have nested for years near poultry yards without touching a chicken show that individuals develop highly selective feeding habits from which they seldom deviate. If the habit of raiding chicken yards is acquired the bird is soon shot. The fact that Cooper's continue to be common indicates that many of them never bother chickens.

VOICE: A variety of loud, deep notes uttered in a rapid cackle; also a drawn-out whistled note that sounds like *swee-ew*.

NEST: (A.) When in a conifer it is a broad, flat platform of sticks lined with chips of outer bark and supported by horizontal branches against the main trunk. In deciduous trees it may be in an upright crotch, in which case it is generally deeper. Normal heights run from 20 to 60 feet, but in treeless country the birds nest in shrubby growths. The 4 eggs (1.9 x 1.5) are dirty white, occasionally spotted with brown.

RANGE: (P. M.) Breeds from Nova Scotia, s. Ontario, c. Alberta, and s. British Columbia south to Florida, the Gulf Coast, and n. Mexico. Winters from s. New England, Ohio, Nebraska, and s.w. British Columbia to Costa Rica.

Red-tailed Hawk*

Buteo jamaicensis—~~4~~42

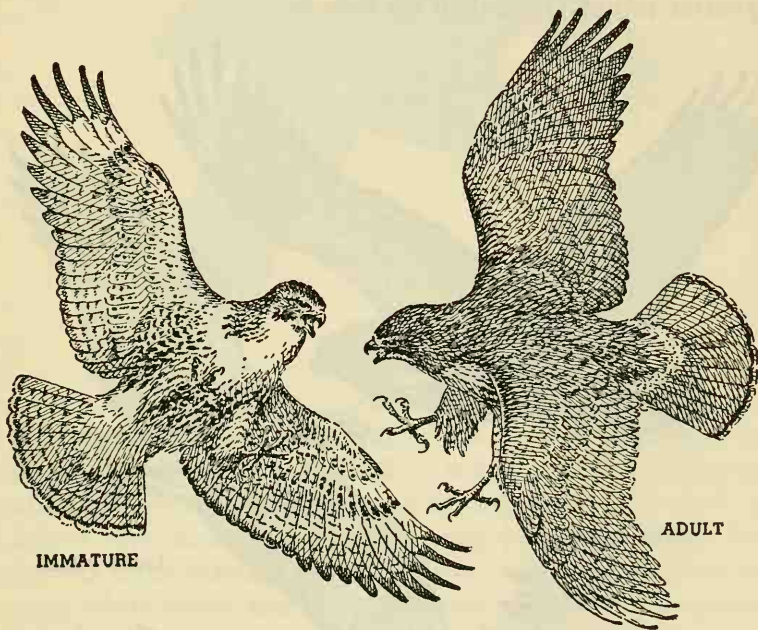
(Red-tailed Buzzard)

♂ L. 20½; W. 48; Wt. 2 lbs.; ♀ L. 22; W. 53; Wt. 2¾ lbs.

IDENTIFICATION: The broad wings and widely expanded tail of this large, soaring bird are its best field marks. The bright reddish upper tail surface and dark bellyband are usually distinctive, but on pale or dark individuals these are not prominent. The gray-brown tail of the young is finely barred with black while that of adults usually has one or more bars near the tip.

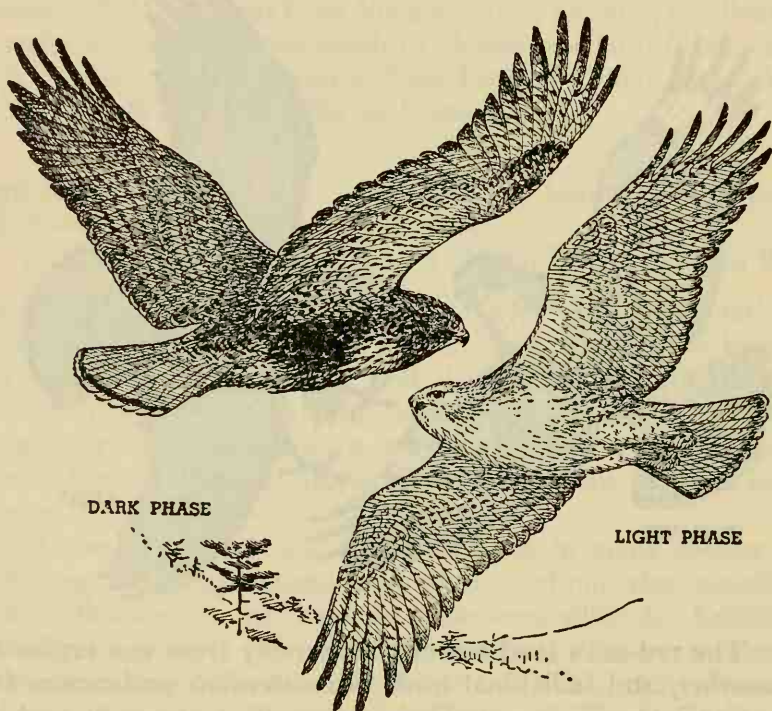
There is so much individual variation in many species of Buteos, including western races of the red-tail, that accurate identification in the field is sometimes difficult. Extreme melanism, rare in some species but quite common in others, produces dark birds that look very much alike, while albinism washes out distinctive colors and markings. The R. T. Peterson "Field Guides" (Eastern and Western), with their excellent flight-pattern drawings and detailed comparisons, are almost essential to the solution of some of these difficult identification problems.

HABITS: (Age 13½ yrs.) Red-tails and other Buteos are very different in habit and appearance from Accipiters or true hawks. This species ranges over most of the continent from the forests of the East to the plains and deserts of the West and from the dwarf subarctic scrub of the North to the Tropics. In the East it is usually found in open woodlands, nesting in mature stands of tall, widely spaced trees or in the occasional large tree in an oak- or pine-barren area. It generally avoids or is soon shot out of well-settled farming country. Once the nesting season is over, the birds wander widely and are found wherever open fields and convenient treetops give perches from which they can watch for prey. A thick, heavy, short-tailed hawk, sitting upright and motionless in the top of a dead tree, is more than likely to be a red-tail. Today it is most abundant in the open country of the West, nesting wherever a cliff ledge, patch of river-bottom timber, or a small tree provides a suitable site.



The red-tail's food varies considerably from one region to another, and individual birds often develop preferences for a certain type of prey. Their extraordinary eyesight enables them to locate prey from a great distance as they soar high overhead or watch from a perch. Once spotted, the animal is pounced upon and caught, often before it realizes its danger. Every kind of small animal from snakes, lizards, and

frogs to crayfish and insects have been found in red-tail stomachs. Small mammals, chiefly rodents, such as meadow mice, squirrels (both ground and tree), gophers, rabbits, and shrews, are staple foods. Red-tails are willing to take any bird stupid or sluggish enough to let itself be caught. These generally appear to be old, diseased, or crippled, as most healthy birds are too alert to be taken by surprise and too fast for a Buteo to catch them in flight. Occasionally the discovery that chickens cannot fly and are easy to catch causes an individual of this species to overcome its instinctive fear of man and become a confirmed raider of poultry yards. Such a bird seldom survives long. The habit of eating carrion, which the red-tail shares with a surprising number of other birds of prey, sometimes earns it an undeserved reputation as a chicken or game-bird eater. Until proved otherwise, every red-tail should be regarded as an asset on a farm or ranch where the small rodents on which they prey often take a greater toll of crops than do insects.



VOICE: A long-drawn-out call, halfway between a hiss and a squeal.

NEST: (I. 28, A.) A large, bulky mass of sticks, lined with shredded inner bark and usually kept decorated with a few

sprigs of fresh green foliage; generally in the tallest tree near the edge of a clump of big timber, but cliff-ledge nests and nests in low trees are not uncommon in open, treeless country. The same nest is often used many years in succession. The 2 or 3 eggs (2.3×1.9) are white, sparingly blotched and spotted with browns.

RANGE: (P. M.) Breeds from Newfoundland, s. Quebec, n. Ontario, c. Mackenzie, and s.e. Alaska south through the United States and Mexico to the Leeward Islands and Panama. Winters from c. New England, s. Michigan, n. Iowa, Wyoming, and s.e. Alaska south.

Harlan's Hawk*
(Harlan's Buzzard)

Buteo harlani—#42
♂ L. $20\frac{3}{4}$; W. 50; Wt. $2\frac{1}{4}$ lbs.;
♀ L. $22\frac{1}{2}$; W. 55; Wt. $3\frac{1}{4}$ lbs.



IDENTIFICATION: The dark markings are largely black rather than brown. There seems to be no normal plumage, as individuals vary from very dark to very light. In dark birds the often extensive white spotting above, the heavy dark spots below, the white-flecked dark wing linings, and the boldly barred flight feathers are distinctive. Light adults may be almost white below and about the head. All have the characteristic Harlan tail, grayish or white, blotched and streaked with dark and with a dark terminal band. The similar pale "krideri" race of the red-tail has a more broadly white-tipped tail with dark bars and usually has more reddish color than is ever present on Harlan's. Young in the dark phase are spotted, with white above, and are like adults except for the barred tail, which is like a young red-tail's. In the light phase the young are hardly distinguishable from "krideri" young.

HABITS: Originally described by Audubon as a distinct species, this bird is very possibly a color phase or race of the red-tail. Its very circumscribed breeding and wintering range, however, lend considerable weight to the arguments of those that regard it as a good species. Observers have reported it as more active than the average red-tail and a heavier feeder on small birds, but in general there seem to be no marked differences between it and the red-tail.

VOICE: A sibilant scream or squeal.

NEST: (A.) One was reported as a mass of sticks 60 feet up in a tall spruce tree in an open spruce woodland. The eggs are unknown.

RANGE: (M.) Breeds in e. Alaska, Yukon, and n. British Columbia. Winters in s. Missouri, Arkansas, Oklahoma, and n. Texas.

Red-shouldered Hawk*

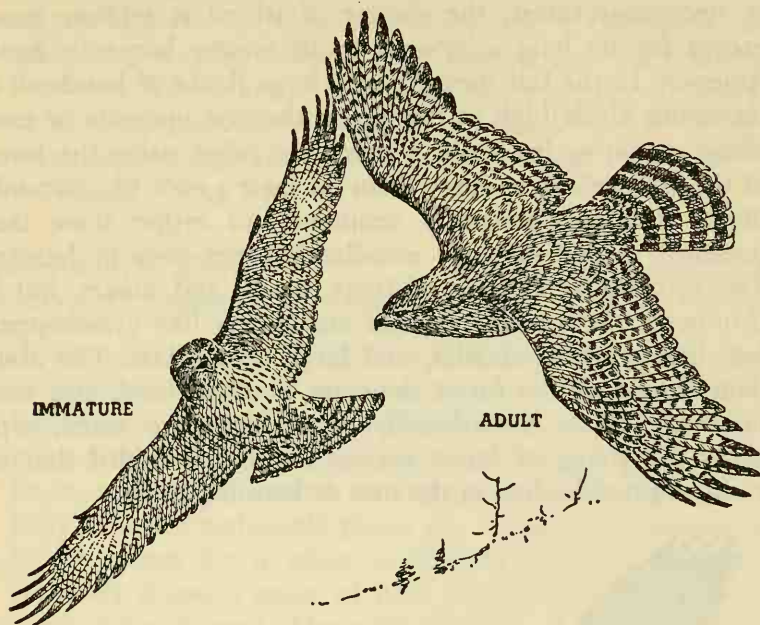
Buteo lineatus—~~42~~

(Red-shouldered Buzzard) ♂ L. 20; W. 38; ♀ L. 22; W. 45

IDENTIFICATION: This bird has a longer tail and is not as chunky as a red-tail. The size and shape of the young separate them from the smaller and stockier but otherwise similar young broad-wings. From below this species shows near the ends of the extended wings a light, finely barred area that appears translucent. Young often have a prominent pale band across the upper wing surface just short of the wing tips.

HABITS: (Age 7½ yrs.) This hawk is most abundant about swamps, river bottoms, and other wet woodlands. If not too persistently persecuted it is usually common in well-settled farming country and is often surprisingly tame. Even a small wood lot will provide an acceptable nest site. In many regions the red-shoulder seems to have benefited from the changes brought by civilization while the red-tail and broad-wing have suffered. This is a comparatively sluggish bird which obtains much of its food about wet areas, where it may sit by the hour in the lower branches of a tree, dropping now and then to capture such favorite items as frogs, snakes, and crayfish. When available, grasshoppers, crickets, and large caterpillars are eaten in quantities, also meadow and white-footed mice and shrews. Stomach examinations reveal that red-shoulders take few birds and little poultry, although their scavenging habits occasionally lead to their being blamed for the death of a quail or pheasant that a hunter wounded and never found.

VOICE: Very noisy in spring and early summer, uttering a loud, far-carrying scream that sounds like a long-drawn-out *kee-you*, a call that the blue jay can imitate to perfection.



NEST: (I. 24, A.) A rather deep, flat-topped structure of sticks mixed with such fine material as leaves, moss lichens, and shredded bark and placed from 20 to 60 feet up in a crotch formed by a main limb or branch. Nests of previous years are often used again, occupancy being indicated by sprigs of fresh green leaves with which active nests are kept decorated and the bits of down that are usually in evidence. Later, when eggs are laid, the nest may be kept lined with fresh green leaves. The 2 or 3 eggs (2.2 x 1.7) in a normal clutch are white, marked (often quite heavily) with browns.

RANGE: (P. M.) Breeds from Nova Scotia, s. Quebec, s. Ontario, and c. Manitoba south to s. Florida, the Gulf Coast, and e.c. Mexico and west to the Great Plains; along the Pacific coast from s. British Columbia to n. Lower California and n.w. Mexico. Winters from c. New England, s. Michigan, and Iowa south.

Broad-winged Hawk*

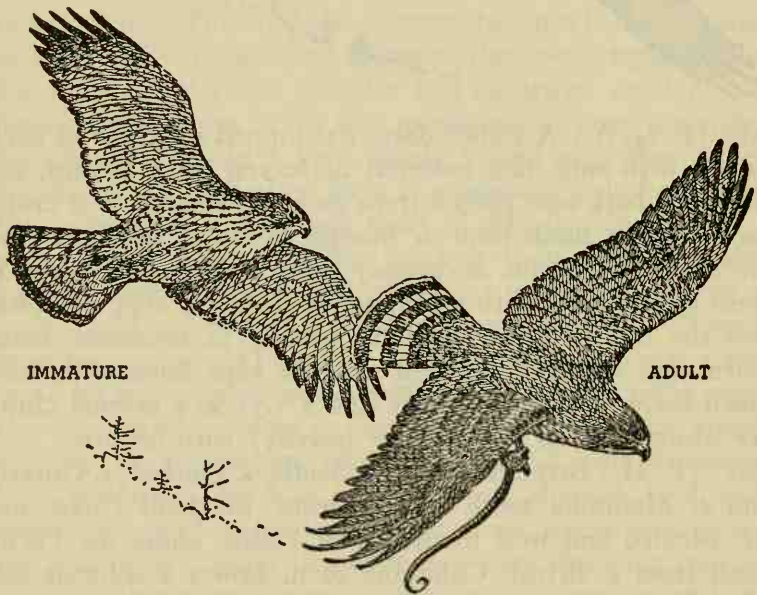
Buteo platypterus—#42

(Broad-winged Buzzard) ♂ L. 15; W. 35; ♀ L. 17; W. 37

IDENTIFICATION: This small hawk has a short tail and a chunky build much like a red-tail. The boldly banded tail of adults

is distinctive. Young birds have tails like the red-shouldered's but have a whiter, black-bordered underwing.

HABITS: This is a characteristic bird of many extensive tracts of deciduous forest, the shelter of which it seldom leaves except for its long migration to its winter home in South America. In the fall spectacularly large flocks of hundreds or thousands circle high in the air on thermal updrafts or coast along on the updraft over a mountain ridge, using the forces of the atmosphere to carry them on their 4,000- to 5,000-mile flight. Although generally common and rather tame their presence in our summer woodlands often goes undetected. The broad-wing is fond of frogs, toads, and snakes, but its commonest late-summer foods are insects like grasshoppers, katydids, crickets, cicadas, and large caterpillars. The abundant shrews of the forest floor are a staple food, and some mice are taken. Occasionally small birds are eaten, especially the young of forest species like the ovenbird that are easily captured when in the nest or learning to fly.



VOICE: When its nesting woods are invaded this bird protests vigorously with a distinctive shrill, hisslike whistle which sounds like *kwee-e-e-e-e*, plaintive, long-drawn-out, and diminishing in volume.

NEST: (I. 23, A., N. 40) A small, loosely built structure placed in a main crotch or against the trunk of a tree 15 to 50 feet up; made of sticks and twigs with a sparse lining of bark

chips, lichen, etc. Most nests are kept decorated with at least a few sprigs of fresh green foliage. The 2 or 3 eggs (1.9 x 1.5) are white with brown and purple markings.

RANGE: (M.) Breeds from New Brunswick, c. Quebec, s. Manitoba, and c. Alberta south to s. Florida and the Gulf Coast west to e. Texas; and the West Indies. Normally winters from s. Mexico south to Venezuela, w. Brazil, and n. Peru, but stragglers occasionally survive as far north as New Jersey and s. Illinois.

Swainson's Hawk*

(Swainson's Buzzard)

Buteo swainsoni—#43

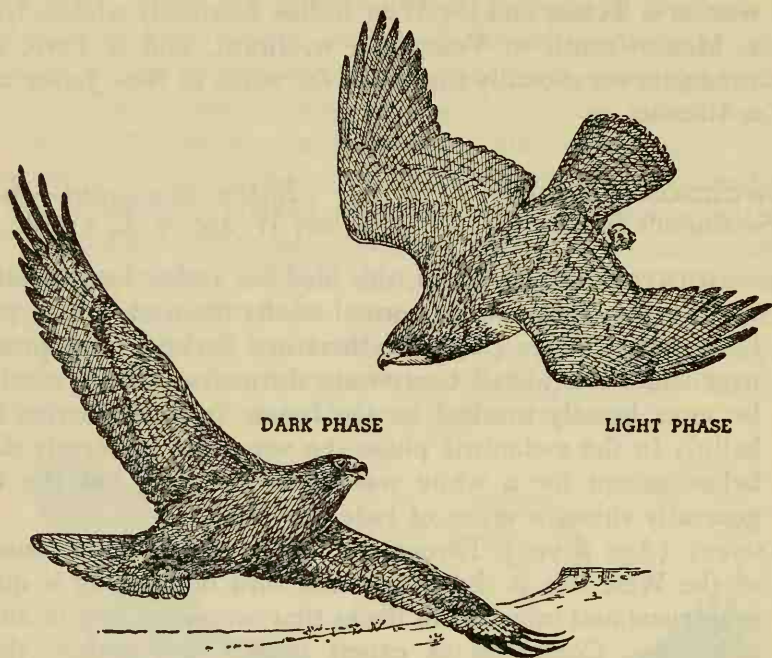
♂ L. 20; W. 49; ♀ L. 21; W. 52

IDENTIFICATION: For a *Buteo*, this bird has rather long, pointed wings and a long tail. In normal adults the dark breast, pale buffy wing linings (flight feathers are darker), and prominent white lateral tail coverts are distinctive. Young tend to be most heavily marked on the breast (red-tails across the belly). In the melanistic phase the wings are uniformly dark below except for a white wash near the end, but the tail generally shows a series of pale gray bars.

HABITS: (Age 8 yrs.) Throughout much of the open country of the West this is the commonest bird of prey. It is quite gregarious and migrates in flocks that are sometimes of enormous size. Composed of expert soarers and gliders, these flocks spiral up on rising columns of warm air until they are almost out of sight. The altitude thus gained is used to glide north or south until another thermal is picked up and the process repeated. This labor-saving device must aid them greatly in their 11,000- to 17,000-mile annual trip to s. South America. When hunting they often fly quite low with wings raised in an open V like a marsh harrier.

The almost universal abuse to which our western grazing lands have been subjected by overstocking has brought about a great increase in grasshoppers, crickets, and rodents through the displacement of the overgrazed grasses by weedy growths—a change that has been favorable to Swainson's hawk. Ground squirrels of various kinds are their principal mammal food, plus an occasional gopher, mouse, or rat. Grasshoppers and crickets are eaten in enormous numbers, more than 200 having been found in a single stomach. The special beds where grasshoppers gather in great hordes in the fall to lay eggs sometimes attract these birds by the thousands. Far fewer young grasshoppers appear following such visits. Swain-

son's hawks commonly frequent highways which afford them opportunities to pick up live animals crossing the road and dead ones. Since they use fence posts and telephone poles as lookouts, they make conspicuous targets for those with a prejudice against all hawks, no matter how useful.



DARK PHASE

LIGHT PHASE

VOICE: A prolonged and rather shrill whistle or squeal, somewhat plaintive in quality.

NEST: (I. 28, A.) The large, bulky nests are of sticks with a lining of finer materials, placed in a tree from about ground level up to considerable heights, depending on the size of the trees locally available. As Swainson's breed where trees are scarce, the nests are generally conspicuous. The 2 eggs (2.2 x 1.7) are dull white, unmarked or sparingly spotted with brown.

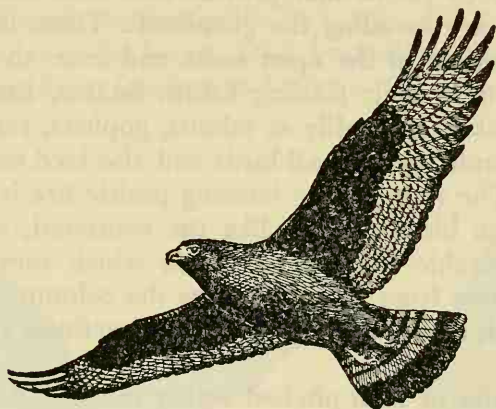
RANGE: (M.) Breeds from c.w. Mackenzie and w. Alaska south to n. Mexico and east to Manitoba, Iowa, Oklahoma, and w. Texas. Winters on the Pampas of n. Argentina. A few wander east in the fall and some winter in extreme southern Florida.

Zone-tailed Hawk*
(Zone-tailed Buzzard)

Buteo albonotatus—#44
L. 20; W. 50

IDENTIFICATION: In flight this long-winged, moderately long-tailed Buteo looks rather like a turkey vulture. The 3 tail

bands are gray above but clear white below and are progressively narrower. The flight feathers are pale below and the wing lining black. Young birds are similar, but the tail is barred with brown above and below shows a single broad dark band near the end and a half dozen narrow ones.



HABITS: River bottoms and the wooded canyons that cut deep into the plateaus and mountains of our Southwest are the home of this Buteo. It is vulture-like even to the angle of the wing and the constant balancing when soaring. Like many tropical birds of prey, it is not as highly specialized in diet as many Temperate Zone species. It seems to take fish, frogs, small mammals, and birds with equal ease. When fishing it is said to hover over the water like an osprey.

VOICE: A series of loud, shrill whistles or screams.

NEST: (A.) In the slender top branches or in the crotch of a very tall woodland tree. The nest is made of sticks with a lining of green-leaved twigs. The 2 white eggs (2.2 x 1.7) are usually unmarked.

RANGE: (P. M.) Breeds from the United States-Mexican border (c.s. Texas to s. California) south to n. South America.

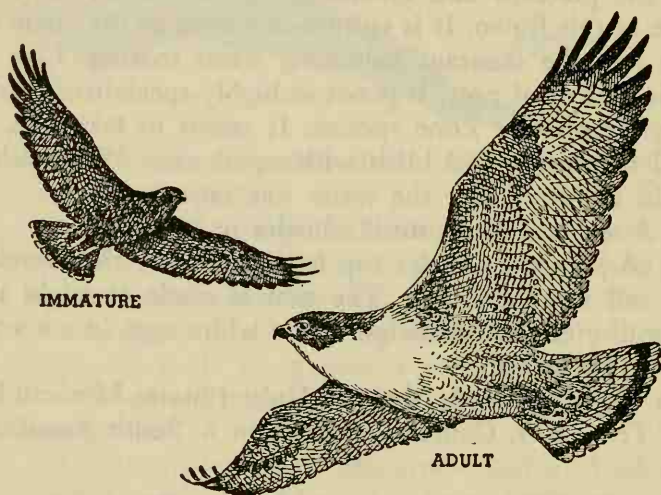
White-tailed Hawk*
(White-tailed Buzzard)

Buteo albicaudatus—~~43~~ 43
L. 23; W. 50

IDENTIFICATION: Long, rather narrow wings for a Buteo and a short tail are good field marks. Adults are distinctive, but young are quite dark all over. From below they appear to have dark wing linings, but the bases of the primaries and secondaries are whitish and the tail is a hoary gray with indistinct dark bars.

HABITS: There are indications that this bird is extending its range northward as overgrazing degrades our southwestern grasslands into semi-desert scrub. Released from the competition of the once dominant bunch grasses and largely protected from the prairie fires that killed them out, many thorny, woody plants that provide nest sites and perches for white-tails are invading the grasslands. These birds do most of their feeding in the open areas and seem to be complete opportunists in their feeding habits. Snakes, lizards, and insects are taken as readily as rabbits, gophers, rats, and mice. They consume many small birds and also feed on carrion like vultures. The vicinity of a burning prairie fire is an excellent place to see birds of prey like the white-tail, as fire makes more vulnerable the animals upon which they feed. They seem to come from as far away as the column of smoke can be descried, and hundreds of hawks sometimes gather for the feast.

VOICE: A series of high-pitched rather musical double notes—*kil-la, kil-la*—that have been likened to those of a laughing gull or the bleat of a goat.



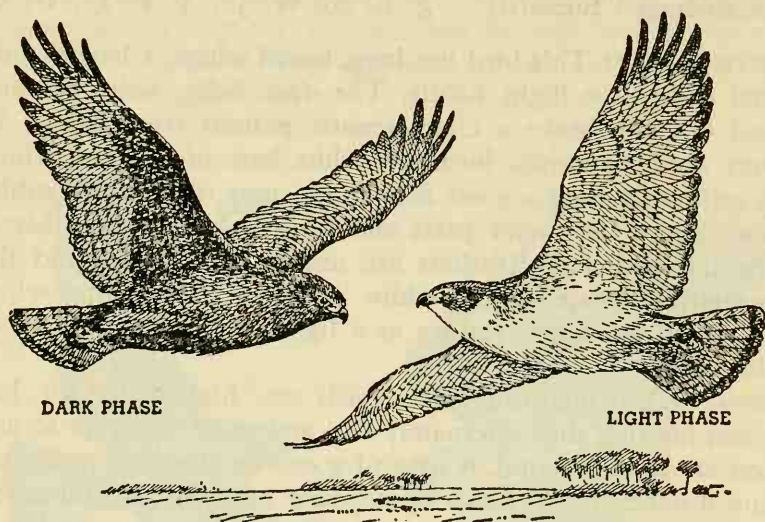
NEST: (A.) A loosely built bulky mass of sticks, well lined with clumps of bunch grass and saddled in the crown of a yucca, desert shrub, or scrub oak from 4 to 12 feet (rarely up to 30) above the ground. The 2 eggs (2.3 x 1.8) are white, unmarked or sparingly spotted with faint browns.

RANGE: (P. M.) Breeds from s.e. Texas and n. Mexico south through much of South America to c. Argentina.

Short-tailed Hawk*
(Short-tailed Buzzard)

Buteo brachyurus—~~45~~
L. 17; W. 35

IDENTIFICATION: This bird has 2 distinct color phases that never seem to intergrade. The white patch at the base of the bill, if it can be seen, is distinctive. Light birds have the whole head and neck hooded with dark gray down to the throat and the sides of the breast. Dark birds show conspicuous light bases to the flight feathers and have a pale gray tail with dark bands.



HABITS: This tropical *Buteo* has always been considered rare in Florida and little is known about it. It seems to be a permanent resident of swamp forests, especially in cypress stands along streams and lake borders as well as in the Big Cypress country and the coastal mangrove swamps. Short-tails seem rather sluggish and evidently do most of their feeding in swamps, using regular lookout perches from which they locate and pounce upon their prey. Were it not for their habit of soaring high on the midday air currents where they are readily picked out among the many other birds that also seem to enjoy this form of recreation, short-tails would seldom be observed. At the rate the trees are being cut, there will be no more big cypress stands left in Florida within a few years, so the future of this bird is very doubtful.

VOICE: A high-pitched whistle or squeal not unlike that of an osprey, also a cackling note.

NEST: (A.) A large, bulky nest of twigs and Spanish moss with a lining of green leaves, always in or near a swamp, frequently in a cypress, generally 60 to 100 feet up and well out on an upper branch. In low coastal mangrove swamps nests are much lower. The 2 eggs (2.1 x 1.7) are white, varying from unmarked to heavily marked with brown.

RANGE: (R.) Occurs from n. Florida and e. Mexico south to n.e. Argentina.

Rough-legged Hawk*

Buteo lagopus—#43

(Rough-legged Buzzard) ♂ L. 20; W. 50; ♀ L. 23; W. 54

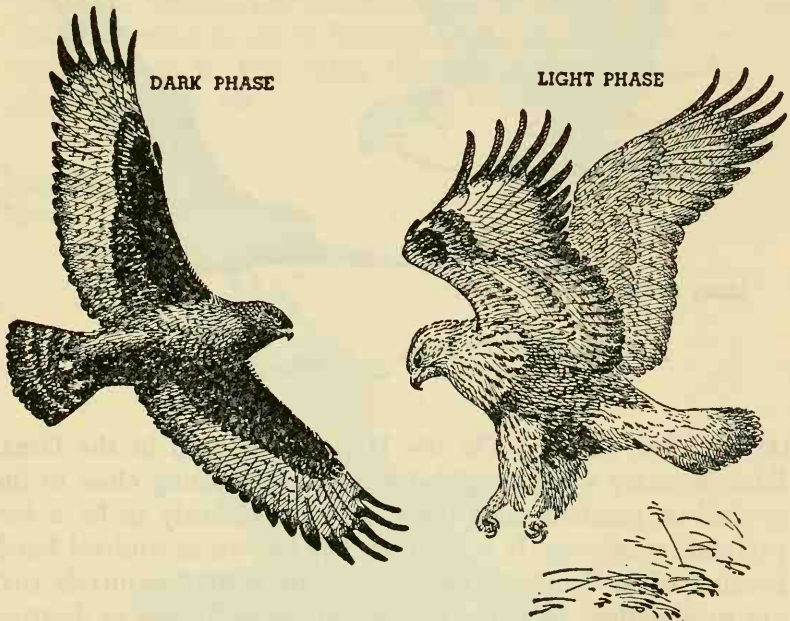
IDENTIFICATION: This bird has long, broad wings, a longish tail, and distinctive flight habits. The dark belly, wrist patches, and tail end make a characteristic pattern from below. In very dark melanistic birds the white base of the tail, which is ordinarily such a good field mark, may not be noticeable; but though the under parts and wing linings may be black, the tail and flight feathers are usually pale below and the primaries conspicuously white at their bases. This white shows on the upper surface as a light patch near the end of the wing.

HABITS: When migrating these birds soar high in the air, but when hunting they alternately flap and glide along 50 to 200 feet above the ground. A rough-leg can be identified at almost any distance by its habit of stopping suddenly in mid-air to hover for a few seconds with rapidly beating wings or hanging motionless on an updraft while it looks for prey. Like other Buteos, it uses lookout perches, favoring low ones, like fence posts, in preference to trees. In the North the food of this rather weak-footed hawk is almost wholly composed of lemmings. On wintering grounds mice are the chief food. In some areas these birds feed on ground squirrels, pocket gophers, and shrews as well as on carrion. Southward and northward migrations usually coincide with the fall or thawing of heavy snow, as they do all their hunting over open, grassy areas or in fallow fields. Along the seacoast they are largely confined to extensive open salt marshes and adjacent sand dunes and meadows. They commonly feed in the half-light of early morning or evening, probably because the small mammals on which they prey are more active then than in midday. They are notably gentle and unsuspicious and so easy to shoot that they are sometimes slaughtered at concentration points along their migration routes. If only hawk

shooters could be persuaded to open the stomach of every bird they shoot, some at least might in time realize the folly of killing these useful birds.

VOICE: Various sibilant, whistled notes, sometimes very loud, at other times soft, musical, and plaintive.

NEST: (I. 31, A., N. 41) Placed at the high point of a rock outcrop, cliff ledge, stream bank, or boulder, where it commands a good view of the surrounding country, or in the top of the tallest tree, 20 or 30 feet aboveground. The same site is used repeatedly, and a large mass of sticks accumulates; the nest is generally lined with bunches of grass and moss. In normal years 3 or 4 eggs are a clutch, but in peak lemming years 5 or 6 are common. The eggs (2.2 x 1.8) are greenish-white with brown markings.

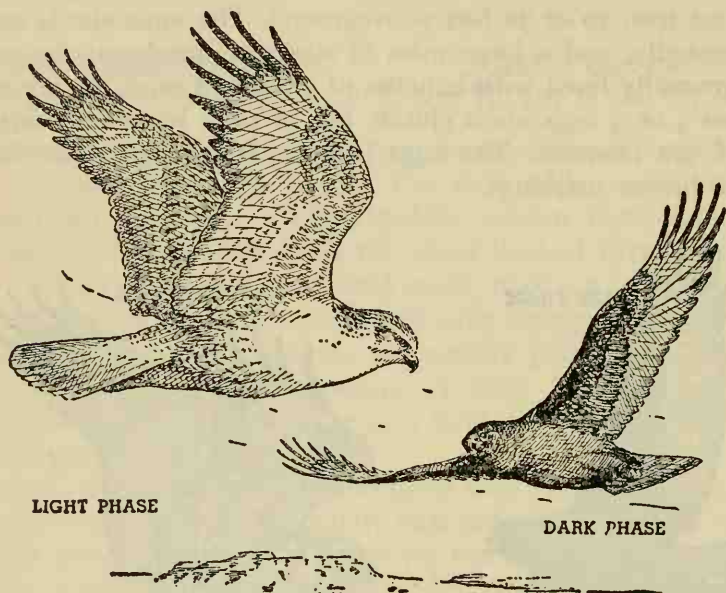


RANGE: (P. M.) Breeds in the arctic tundra and the northern edge of the Hudsonian forest throughout the Northern Hemisphere. Winters from its breeding grounds south in North America to North Carolina, s. Louisiana, s. New Mexico, and s. California; abroad to Switzerland, Transcaspia, and Japan.

Ferruginous Rough-legged Hawk* *Buteo regalis*—#43
(Ferruginous Rough-legged Buzzard) L. 24; W. 56

IDENTIFICATION: The pale head, largely white tail, white patch on the upper wing surface near the tip, and the bright red-

dish-brown of the shoulders, rump, and thighs of a normal adult are distinctive. Young are less reddish above and rather uniformly pale buffy below, and the tail is barred with gray and brown toward the tip. Melanistic birds are dark above except for a uniformly grayish tail and a white wing patch, and dark below except for the silvery-white tail and flight feathers.



HABITS: (Age 20 yrs.) On the High Plains and in the Great Basin country a big reddish-brown hawk hunting close to the ground or perched on a fence or knoll is likely to be a ferruginous rough-leg. It is often locally known as squirrel hawk because of its fondness for the various ground squirrels that are so abundant in many western areas and often so destructive to cultivated crops. Rabbits, mice, and the host of other small rodents of vast open grasslands and semi-arid areas are also utilized for food. Occasionally a bird like a meadowlark is captured, but birds do not form an appreciable part of the diet.

Despite the fact that for more than 100 years every ornithologist who has written about this bird has called attention to its great value as a check on rodents and its complete harmlessness to poultry, this once abundant species has been so persecuted that it is now rare in many parts of its former range. Even today it is not unusual to see carcasses of these

fine birds draped over highway fences—grim reminders of how much educational work we still have to do.

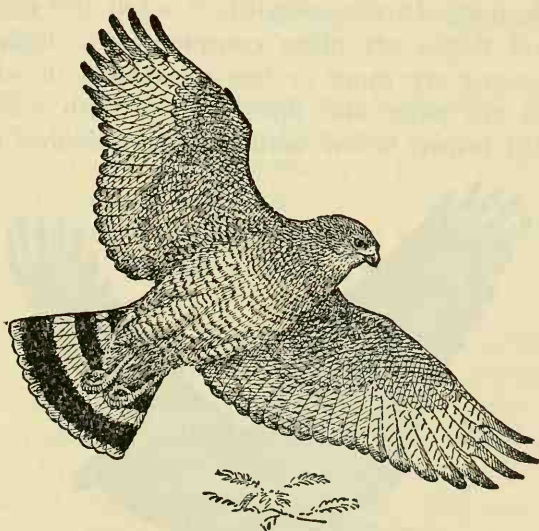
VOICE: Rather weak, high-pitched screams and squeals, some of which are quite harsh and gull-like.

NEST: (I. 28, A., N. 60) Either in the tallest available tree anywhere from 6 to 60 feet up, on a cliff ledge, or on top of a rocky pinnacle or boulder-strewn elevation. Nests are used year after year and sometimes reach enormous size. They are made of large sticks, old bones, and other miscellaneous material with a lining of bunch grass, shredded bark, and, invariably, cow or horse dung. The 5 eggs (2.4 x 1.9) are white, boldly marked with browns.

RANGE: (P. M.) Breeds from s. Manitoba and s. Alberta south to s. New Mexico, east to w. Nebraska and n.w. Texas, and west to c. Oregon and Nevada. Winters from s. South Dakota and e. Oregon south to Hidalgo and s. Lower California and wanders east to Wisconsin, Illinois, and Louisiana and west through California.

Gray Hawk*
(Mexican Goshawk)

Buteo nitida—#42
L. 17; W. 35



IDENTIFICATION: The white rump and broadly banded tail are good field marks. In flight the finely barred wing linings are the same color as the breast, but flight feathers are white, tipped with black. Young birds have numerous dark bars on the tail and much light reddish-brown on the upper parts.

HABITS: This tropical species, which barely reaches our borders, inhabits the mature open woodlands of river valleys in the semi-arid and otherwise rather open country of our Southwest, feeding in the woods and in adjacent grasslands. Although a Buteo, it has a swift, direct flight and captures a wide variety of prey. It seems especially fond of lizards, but snakes, insects, rodents, and birds are also taken.

VOICE: A musical piping note as well as more sibilant calls.

NEST: (A.) Generally in the slender top branches of a very tall tree in a wooded river or creek bottom. Nests are small, rather flat platforms of twigs, most of which are broken off alive and green. The 2 or 3 white eggs (2.0 x 1.6) are unmarked.

RANGE: (P. M.) Breeds from the United States-Mexican border region south to s. Brazil and e. Bolivia. There is a winter withdrawal of the most northerly breeders into n. Mexico.

Harris' Hawk*

Parabuteo unicinctus—~~44~~

(Chestnut-thighed Buzzard) ♂ L. 19; W. 42; ♀ L. 22; W. 45

IDENTIFICATION: The extensive white area above and below at the base of the long white-tipped tail is a good field mark in any plumage. In the sooty-black adult the chestnut wing linings and thighs are often conspicuous in flight. The less blackish young are more or less streaked with white below; the thighs are paler and finely barred with white and the tail is light brown below without a conspicuous tip.



HABITS: The semi-arid lands of the Southwest, where thickets of mesquite and other thorny shrubs are scattered over flat open grasslands and the watercourses are a tangle of low

trees and shrubs, are the home of this heavy, powerfully built, but often sluggish-appearing hawk. Most feeding is done in the early morning or evening, and during much of the midday period the birds sit on a conspicuous perch paying little attention to anything, or soar high in the air. When on the hunt their flight is powerful and fast and they dash through thickets and along stream margins with great speed and control. Apparently they are able to capture rodents and birds with equal ease and are not above eating carrion. Thus their diet is largely a matter of what happens to be locally most abundant and easiest to obtain.

VOICE: A low, harsh cry or a more prolonged scream.

NEST: (A.) Generally low, in the top of a cactus, yucca, mesquite, or other low tree, anywhere from 5 to 30 feet up; of sticks and lined with grass, green twigs, and other soft material; usually small and compact. The 3 or 4 eggs (2.1 x 1.7) are white, some faintly marked with brown.

RANGE: (P. M.) Breeds from s. Texas, s. New Mexico, and s.e. California south to c. Argentina and c. Chile. Winters from breeding areas south. Large flocks are encountered in fall, indicating some migration or wandering at this season.

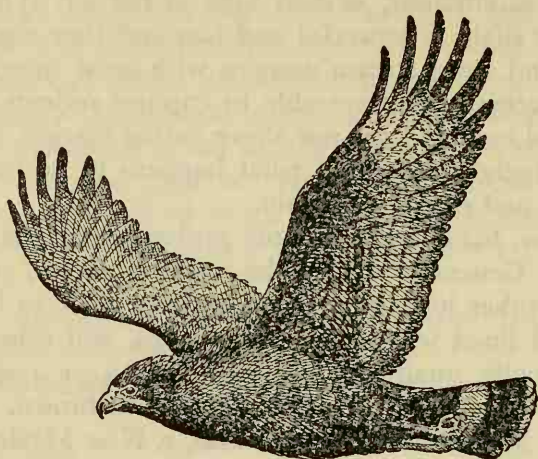
Black Hawk*
(Crab Hawk)

Buteogallus anthracinus—~~45~~ 45
L. 21; W. 48

IDENTIFICATION: This is a chunky bird with short, broad wings and a short tail, white at the base and tip and with a broad white central band. The underwing is black with some rusty in the flight feathers and a short diagonal white patch near the end. The brown young have light heads, buffy wing linings, white flight feathers, and a tail that shows about 6 black and white bands.

HABITS: The very broad wings give this bird great buoyancy and a superficial resemblance to the black vulture. It soars with ease and at times indulges in spectacular earthward dives. In flight the long yellow legs frequently dangle in a very distinctive manner. Moist woodlands in the vicinity of water seem to be the normal habitat. The species usually appears rather tame and sluggish, spending much of its time perched on a low branch of a tree overlooking water. Fish, frogs, crayfish, and reptiles are often its chief foods, but in some regions it feeds almost exclusively on land crabs. Small mammals, birds, and insects are also included in its rather broad diet.

VOICE: A loud, harsh, strongly accented call of 4 distinct notes that has been likened to the squawk of a night heron. Other whistled or squeal-like calls have been noted.



NEST: (A.) Commonly 2 to 30 feet up in a small tree, often saddled on a clump of mistletoe; constructed of sticks with a lining of green leaves. New nests are small but are used year after year and may become very large. The 1 or 2 eggs (2.3 x 1.8) are white, sparingly marked with brown.

RANGE: (R.) Occurs from the United States-Mexican border region south to n. South America and the Lesser Antilles.

Golden Eagle*

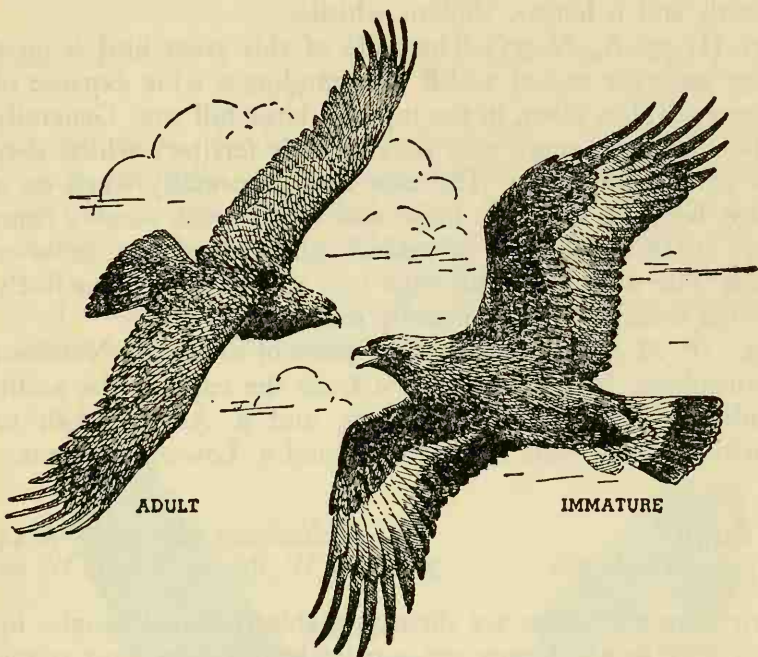
Aquila chrysaëtos—~~44~~44

♂ L. 33; W. 79; Wt. 9 lbs.; ♀ L. 38; W. 87; Wt. 12 lbs.

IDENTIFICATION: Eagles have noticeably big heads and necks and powerful bills, and the broad wings of this species give it a robust look. Adults are dark except for the inconspicuous "golden" head and white tail base. Young have white tails with a broad, sharply defined black terminal band and show a white patch on both wing surfaces.

HABITS: (Age 30 yrs.) The range of this splendid bird covers more than half the land in the world, but it breeds and is most commonly encountered in hilly or mountainous country where extensive areas of open land are available for hunting. After the nesting season young and, to some extent, adults wander widely and may turn up almost anywhere. In recent years the golden eagle has been not uncommon during the

fall flight of birds of prey down the Appalachian Mountain Range—wintering in its southern half. It also seems likely that a few breed in our eastern mountains. In the more rugged West they are quite uniformly distributed but never common, as studies show that each pair defends a breeding territory of anywhere from 20 to 60 square miles, a township (36 square miles) being about the average. No other golden eagle is allowed to enter this territory, and occasionally, if food is scarce, the presence of red-tails and horned owls is so much resented that they are systematically hunted down and killed.



The golden eagle makes extensive use of air currents. If within the breeding territory there is a hill or cliff that deflects the wind and creates a strong updraft, it serves as a kind of elevator. The bird carries heavy prey into it, then with set wings spirals upward until enough altitude has been gained for a straight glide to the aerie. The food of any wide-ranging species like this is varied. Rabbits, squirrels, woodchucks, and other small mammals are staples, but at times these eagles successfully attack larger prey like raccoons and foxes, and they have been known to kill deer that were weakened by starvation and handicapped by deep snow. They also take skunks and domestic cats. Sometimes they feed

heavily on coots, ducks, grouse, and other big birds, including, on occasion, domestic fowl. As they are capable of carrying prey nearly equal to their own weight, it is not surprising that an occasional individual or pair gets into the habit of picking up such domestic stock as young pigs, kids, or lambs. However, studies at hundreds of nests indicate that this is rare and is no justification for persecuting the species as a whole. Like so many birds of prey, the golden eagle also consumes a great deal of carrion, and the fact that it is found eating an animal is no proof that it caused its death.

VOICE: The seldom-heard calls are a series of short, high-pitched squeals and a longer, sibilant whistle.

NEST: (I. 43, A., N. 75) The aerie of this great bird is on a ledge near the top of a cliff commanding a wide expanse of country or, less often, in the top of a large tall tree. Generally a pair has 2 or more nest sites in their territory which they use in alternate years. The nest itself, especially when on a ledge, becomes in time a huge mass of material, ranging from large sticks to all kinds of rubbish and is lined with grass or moss. The 2 or 3 whitish eggs (2.9 x 2.3) vary from finely spotted with brown to virtually unmarked.

RANGE: (P. M.) Breeds throughout parts of the entire Northern Hemisphere. In North America from the edge of the arctic tundra in Ungava, n. Mackenzie, and n. Alaska south to North Carolina (mts.), c. Mexico, and n. Lower California.

Sea Eagle*

(Gray Sea Eagle)

Haliaeetus albicilla—~~44~~

♂ L. 34; W. 85; ♀ L. 38; W. 92

IDENTIFICATION: Adults are distinguishable from bald eagles by their gray heads. Young are a paler brown than most young balds, and the feather tips and centers are so dark that the upper parts appear spotted and the under parts streaked.

HABITS: This is the Eurasian equivalent of our bald eagle, and the two seem to occupy virtually identical ecological niches in the wildlife communities of the areas where they breed. Young birds are great wanderers and do not nest until they assume adult plumage at about 4 years of age. Undoubtedly an occasional young Greenland bird wanders south to winter on our northern coasts, but its great similarity to a young bald eagle makes sight identification questionable. Like our bird, this white-tailed eagle occurs along seacoasts and inland near large lakes, rivers, and marshes, where it feeds on fish, carrion, water birds, and small mammals.

VOICE: A squeaky, high-pitched chatter.

NEST: (I. 45, A., N. 70) On a sea cliff or in the top of a tall tree. The nests are used year after year and become huge masses of sticks and debris of every description with a lining of soft materials. The 2 eggs (3.0 x 2.3) are white and unmarked.

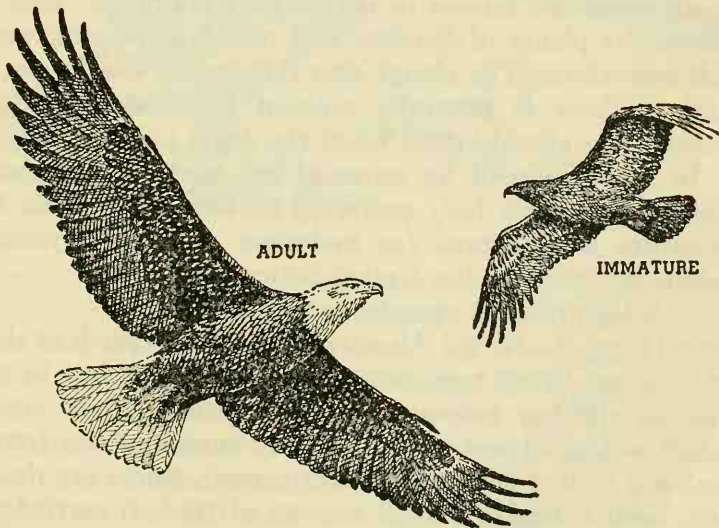
RANGE: (P. M.) Breeds from c.w. Greenland and Iceland east through n. Europe and Asia to the Commander Islands and south to n. Germany, Greece, Persia, and Japan. Winters south to n. Africa, n. India, and s. China. Has wandered south to Massachusetts and east to the Aleutians.

Bald Eagle*

Haliaeetus leucocephalus—#44

♂ L. 34; W. 80; ♀ L. 36; W. 85; Wt. 13 lbs.

IDENTIFICATION: Adults are unmistakable. Young have longer wings and tails than goldens and bigger bills and seem to have a lot more head and neck. Although the young lack definite white areas until they develop white heads and tails early in their fourth year, the plumage of many is irregularly and often extensively blotched with white. When soaring the eagles keep the wings horizontal.



HABITS: The bald eagle and its relatives, often called sea eagles, are seldom found far from water, but lakes, large rivers, and coastal bays are as acceptable as seacoast. The birds seem to mate for life and occupy the same territory year after year, although they may leave it for a few months after the young

have fledged. An eagle's territory is generally at least several square miles in area, and in it a pair frequently has more than one nest ready for use at any time. The great horned owl, the most serious disturber of their peace except man, is apparently able to take over the eagles' nest at will and force them into another site.

Fish are the staple and sometimes the only food of bald eagles. Some they catch by plucking them from the surface of the water; others they steal from ospreys; a great many they find dead, like the spent salmon of the Northwest that die after spawning. In the Far North these eagles often nest near colonies of sea birds like murre and auks on which they feed. Elsewhere they occasionally feed on other birds and mammals.

When not on their breeding grounds bald eagles, especially the dark young, are apt to concentrate in favorable feeding areas—ice-choked rivers, densely populated duck marshes, and even garbage dumps. A healthy duck that can fly is too fast for them, but they quickly spot a crippled, sick, or lead-poisoned duck and keep after it until it is so exhausted that it can be picked up from the water. It has been estimated that one third of all ducks shot are never retrieved and thousands more are known to die of lead poisoning. This gives the eagles plenty of humane and useful scavenging work in fall and winter. The charge that this species eats lambs, pigs, and chickens is generally without foundation unless the animal was already dead when the eagle found it.

In recognition of its status as our national emblem, the bald eagle is now fully protected by federal law, and heavy penalties are imposed for molesting nest, eggs, young, or adults anywhere in the United States at any time.

VOICE: A high-pitched squeaky cackle or chatter.

NEST: (I. 35, A., N. 75) Usually in the main crotch at the top of a large, living tree, rarely in a dead one, but in a few regions cliff-top ledges are common sites. Nests are used again and again and grow in time to enormous size (one record was 20 feet deep and 10 feet across). Sticks are the basic structural material, but all manner of trash is carried to fill in the center, and quantities of any available soft material are used for lining. The 2 eggs (2.8×2.1) are dull white.

RANGE: (P. M.) Breeds from Ungava, n. Mackenzie, Alaska, and n.e. Siberia south to s. Florida, the Gulf Coast, n. Mexico, and s. Lower California. There is a southward movement of northern breeders in the fall and a northward one

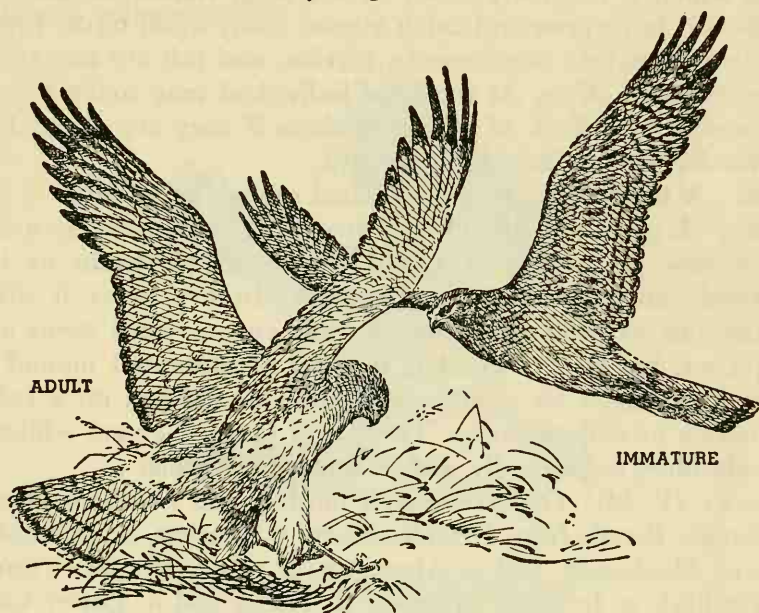
in the late spring from the southern areas where eagles breed in midwinter—Florida-reared young summer in Canada.

Marsh Hawk

Circus cyaneus—#39

(Hen-Harrier) ♂ L. 19; W. 42; ♀ L. 22; W. 49; Wt. 1¼ lbs.

IDENTIFICATION: This harrier has long wings, a long tail, and curious owl-like facial disks, but its conspicuous white rump is its best identification mark. The pale gray male with black wing tips is gull-like in appearance and quite different from the brown females and young.



HABITS: (Age 8 yrs.) A large gray or brown bird slowly quartering near the ground, alternating a few deliberate beats of its long wings with glides, is sure to be a marsh hawk. In gliding, the wings are held well above the horizontal in an open V and the body constantly tilts from side to side as the bird alters the direction of flight. In spring males engage in spectacular courtship with a series of dives, each ending in a sharp upturn and stall, followed by another dive. These birds always perch on a low post or snag near the ground, but occasionally during migration, when making use of air currents, they are seen high in the air.

Although this hawk has suffered from extensive and none too wise drainage of marshes and from wanton persecution, it has survived better than most birds of prey. In many areas

its feeding grounds have expanded as forests have been replaced by low growths. Its habit of nesting on the ground, while exposing it to animal predation, makes it less vulnerable to human disturbance than hawks that build tree nests. Its reproductive rate is nearly twice that of most hawks.

Small mammals up to the size of rabbits are the primary food. In migration and on wintering grounds marsh hawks often gather in large numbers in areas where meadow mice or, in the South, cotton rats have reached high population levels. Though it is not a fast flier, the bird's hunting method, in which it is greatly aided by the long, rudderlike tail, enables it to surprise and catch a good many small birds. Frogs, snakes, crayfish, large insects, carrion, and fish are also taken as occasion offers. At times an individual may make serious inroads on a flock of young chickens if they are allowed to wander too far from the barnyard.

VOICE: A series of short, high-pitched squeals or whistles.

NEST: (I. 31, A., N. 38) On the ground in or adjacent to a low meadow or marshy area and placed where shrubs or tall weedy growths afford concealment. In dry areas it often amounts to little more than a loose cup of weed stems and grasses, but in wet areas it may be a substantial mound of such materials on a stick foundation or saddled on a sedge tussock or willow clump. The 5 eggs (1.8 x 1.4) are white or pale blue, occasionally with a few brown spots.

RANGE: (P. M.) Occurs through most of the Northern Hemisphere. Breeds from Newfoundland, c. Quebec, n. Manitoba, n.w. Mackenzie, and n. Alaska south to s.e. Virginia (rarely Florida), s. Indiana, Arkansas, s. Texas, and n. Lower California. Winters from c. New England, s. Michigan, South Dakota, and s. British Columbia south to the n. West Indies and Colombia. Abroad it breeds in Eurasia from the Arctic Circle south to n. Spain, Italy, Turkestan, and Tibet and winters south to n. Africa, India, and s. China.

OSPREYS

Family Pandioninae

Osprey*
(Fish Hawk)

Pandion haliaetus—~~44~~
L. 23; W. 68; Wt. 3½ lbs.

IDENTIFICATION: These large birds are unmistakable if seen well. In flight the wings appear quite long and the outer half

usually has a characteristic backward sweep. Young birds differ only in being flecked with white above and washed with buffy below.

HABITS: (Age 21 yrs.) Provided they are not molested, ospreys will nest wherever reasonably extensive bodies of clear water and some sort of elevated nest sites exist. Seacoasts, bays, large lakes or rivers, and groups of small ponds are all acceptable. The birds have little fear of man and are excellent "watchdogs," cheeping loudly at intruders and driving off crows and other birds of prey. For this reason platforms on tall poles are often erected to encourage them to nest about homes and farmyards.



Their food consists entirely of fish. These they spot from heights of 30 to 100 feet; then after hovering a moment to get into position, they half close their wings and plunge into the water. The fish is seized in their talons, the toes of which are used in pairs, 2 to a side; this and the rough surface of the foot give them a firm grip on the slipperiest prey. After a catch they rise quickly, shake off the water, arrange the fish headfirst, and set out for their nest or feeding perch. If a bald eagle sees the catch from overhead it dives down and forces the osprey to give it up. For successful fishing ospreys must have clear water and fish that feed or swim near the surface. In salt water menhaden, mullet, sea cat, and, in spring, alewives and other herring provide the bulk of their

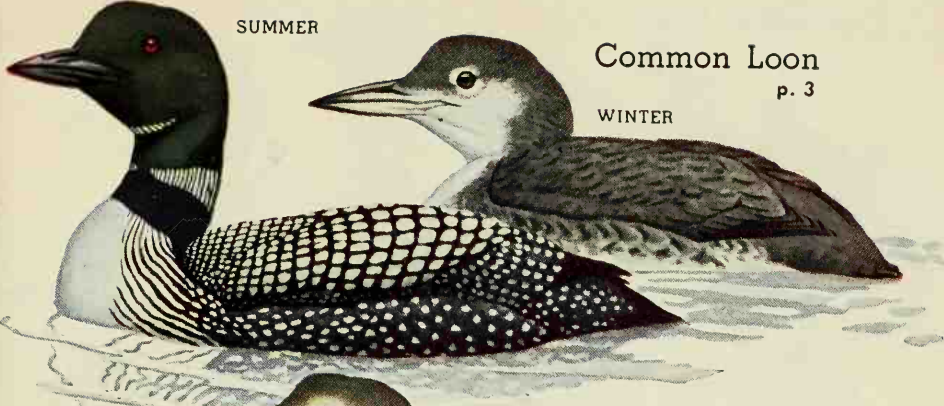
food. In fresh water suckers, perch, and gizzard shad are common prey. Ospreys take some carp when they are spawning in shallow water, but these introduced fish often drastically reduce the bird's potential feeding grounds by roiling the water so badly that it cannot see its prey.

Unfortunately, ospreys are strongly attracted to hatcheries where large numbers of fish are concentrated in a small area. They are so fearless that it is almost impossible to drive them away. To date the none too satisfactory solution has been to shoot them, and in many regions they are becoming scarce as a result. A far better way is to screen the small ponds where cold-water fish like trout are kept. Warm-water pond fish like bass can be protected by keeping the ponds well fertilized. This not only makes the fish grow faster but produces a green algae "bloom" that makes it impossible for the osprey to fish the waters effectively.

VOICE: Distinctive in tone, although the notes vary considerably. Common calls are a long series of loud, sharp, high-pitched whistled notes that vary from a rising *whew*, *whew* to a rich *cheeap*, *cheeap*. From a distance they sometimes suggest the liquid notes of a purple martin.

NEST: (I. 38, A., N. 52) Singly or in loose colonies scattered over a considerable area. Nests may be any height above-ground and are built in trees, living or dead, on man-made structures of all kinds, on rocky canyonside pinnacles, and sometimes on the ground along the upper beach. Year after year material is added until the nest becomes an enormous mass of sticks and any other trash the birds can carry, much of it gleaned from the wrack along the upper beach. The 3 eggs (2.4 x 1.8) are white to cinnamon, heavily blotched with browns.

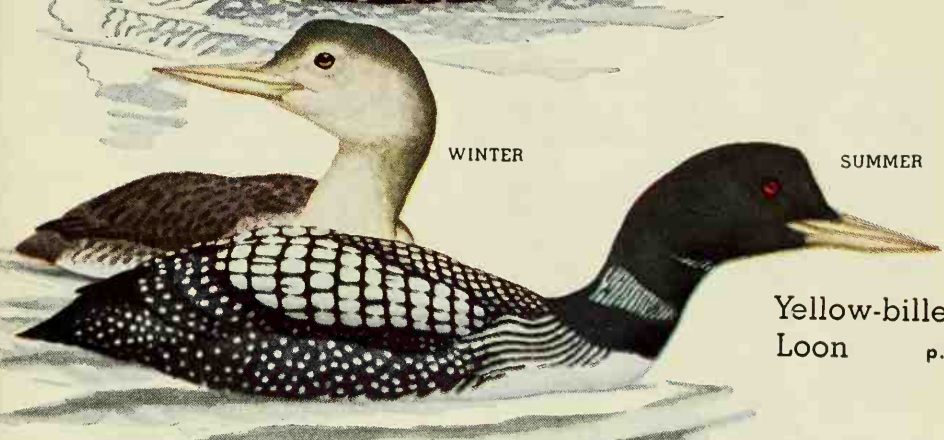
RANGE: (P. M.) Practically world-wide. In the Western Hemisphere breeds from Newfoundland, s. Ungava, n. Manitoba, n.w. Mackenzie, and n.w. Alaska, south to the Bahamas, the Florida Keys, the Gulf Coast to British Honduras, and to w. Mexico. Winters from Florida, the Gulf States, and s. California south to Paraguay, n. Argentina, and Chile. Also breeds in all of Europe, n. Africa, most of Asia, the East Indies, and Australia and migrates to South Africa and India.



SUMMER

Common Loon
p. 3

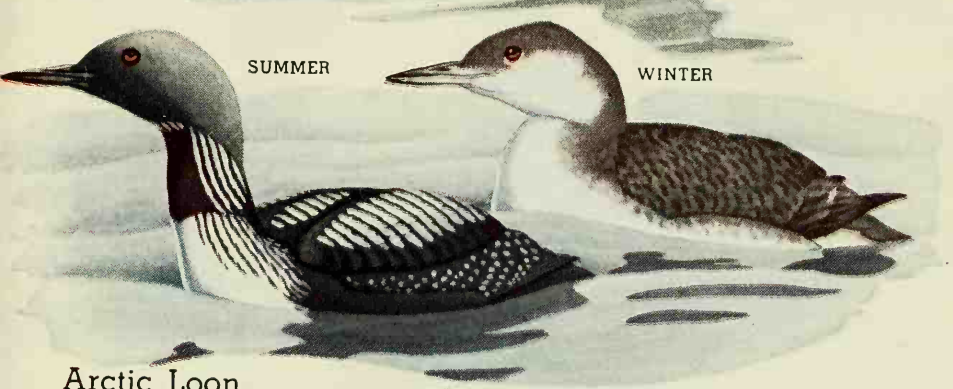
WINTER



WINTER

SUMMER

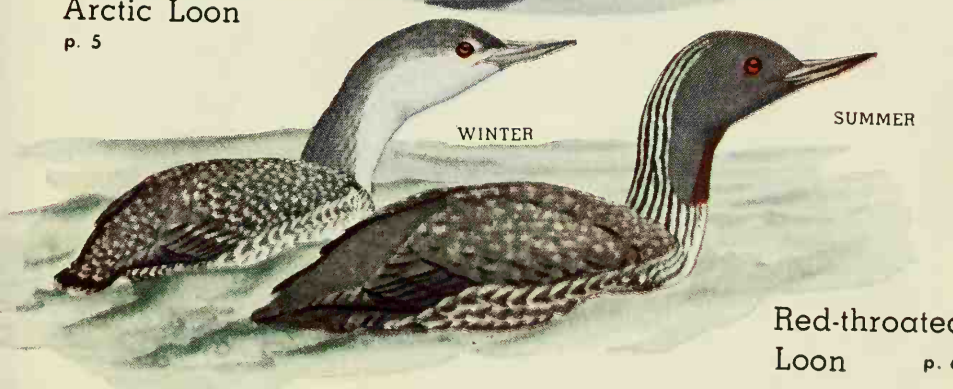
Yellow-billed
Loon
p. 4



SUMMER

WINTER

Arctic Loon
p. 5



WINTER

SUMMER

Red-throated
Loon
p. 6

Pied-billed Grebe p. 12

JUVENILE

CHICK

SUMMER

WINTER

Least Grebe p. 11

SUMMER

WINTER

WINTER

SUMMER

Horned Grebe

p. 9

Eared Grebe

p. 10

SUMMER

WINTER

Western Grebe

p. 11

SUMMER

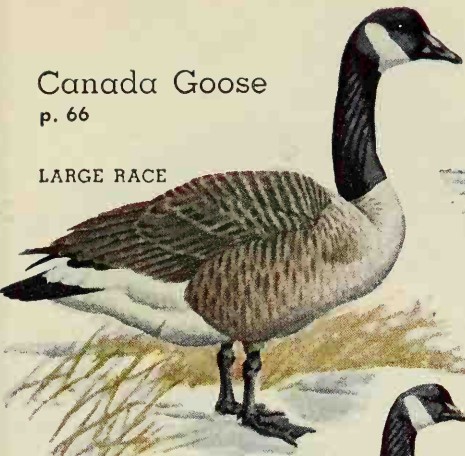
WINTER

Red-necked Grebe

p. 7

Canada Goose
p. 66

LARGE RACE

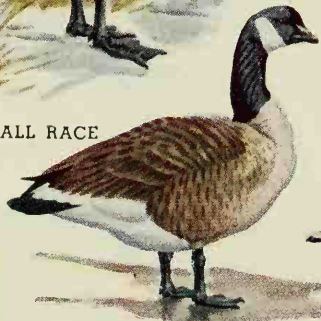


Brant
p. 68

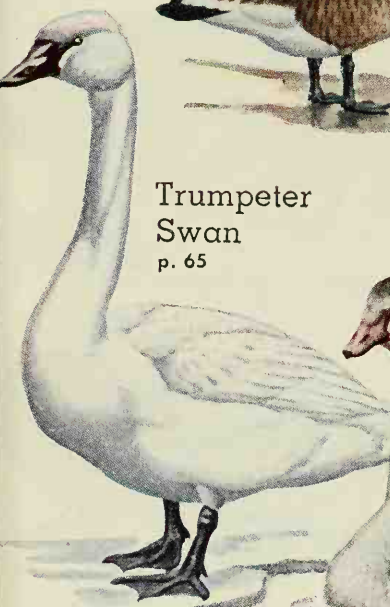


Barnacle
Goose
p. 69

SMALL RACE



Trumpeter
Swan
p. 65



Whistling Swan
p. 63
ADULT

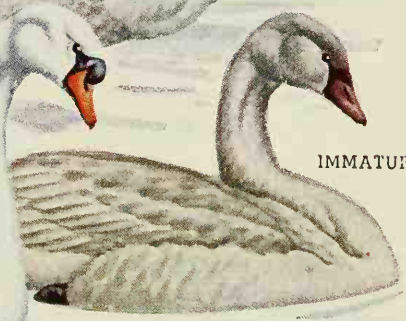
IMMATURE



ADULT



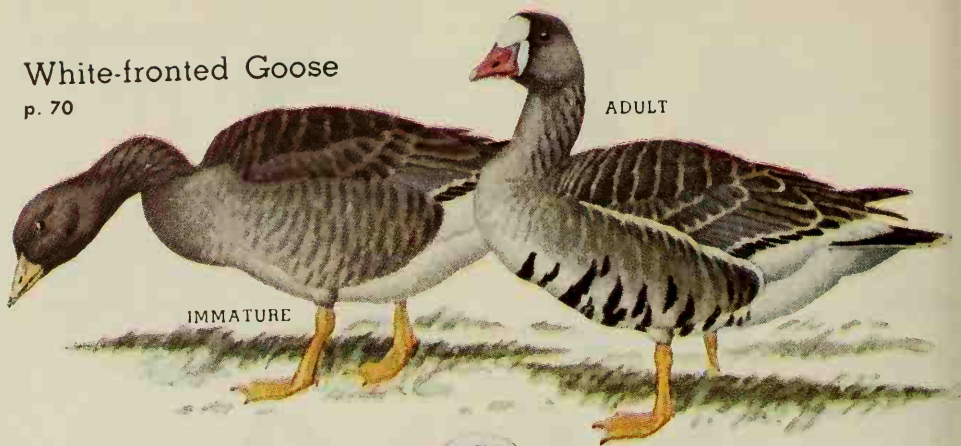
IMMATURE



Mute Swan
p. 62

White-fronted Goose

p. 70



ADULT

IMMATURE

Blue Goose

p. 72



IMMATURE



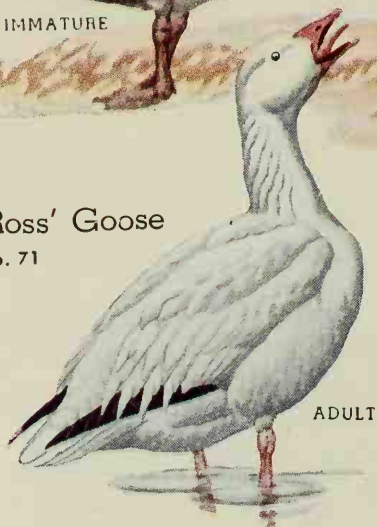
ADULT



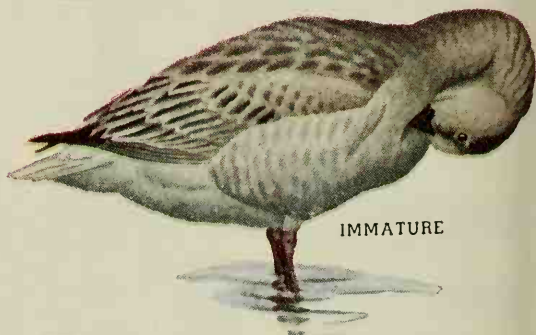
Snow x Blue
hybrid
p. 73

Ross' Goose

p. 71



ADULT



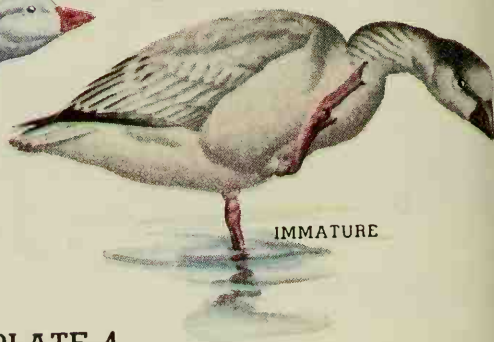
IMMATURE

Ross Goose

p. 74



ADULT



IMMATURE



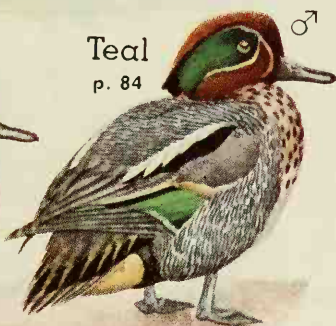
Wood Duck p. 92

♂ ECLIPSE



Green-winged Teal p. 84

♂



Teal p. 84

♂



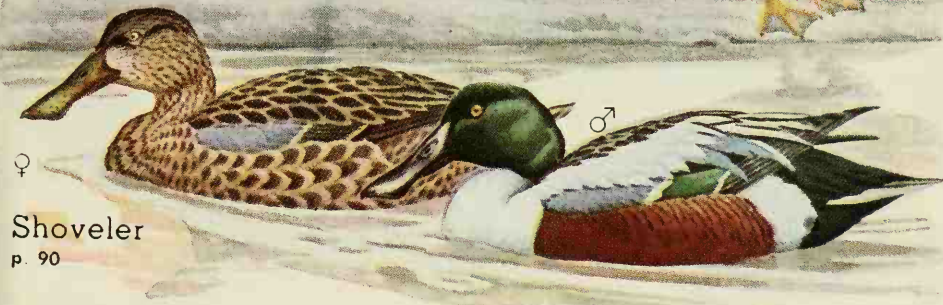
Blue-winged Teal p. 85

♀



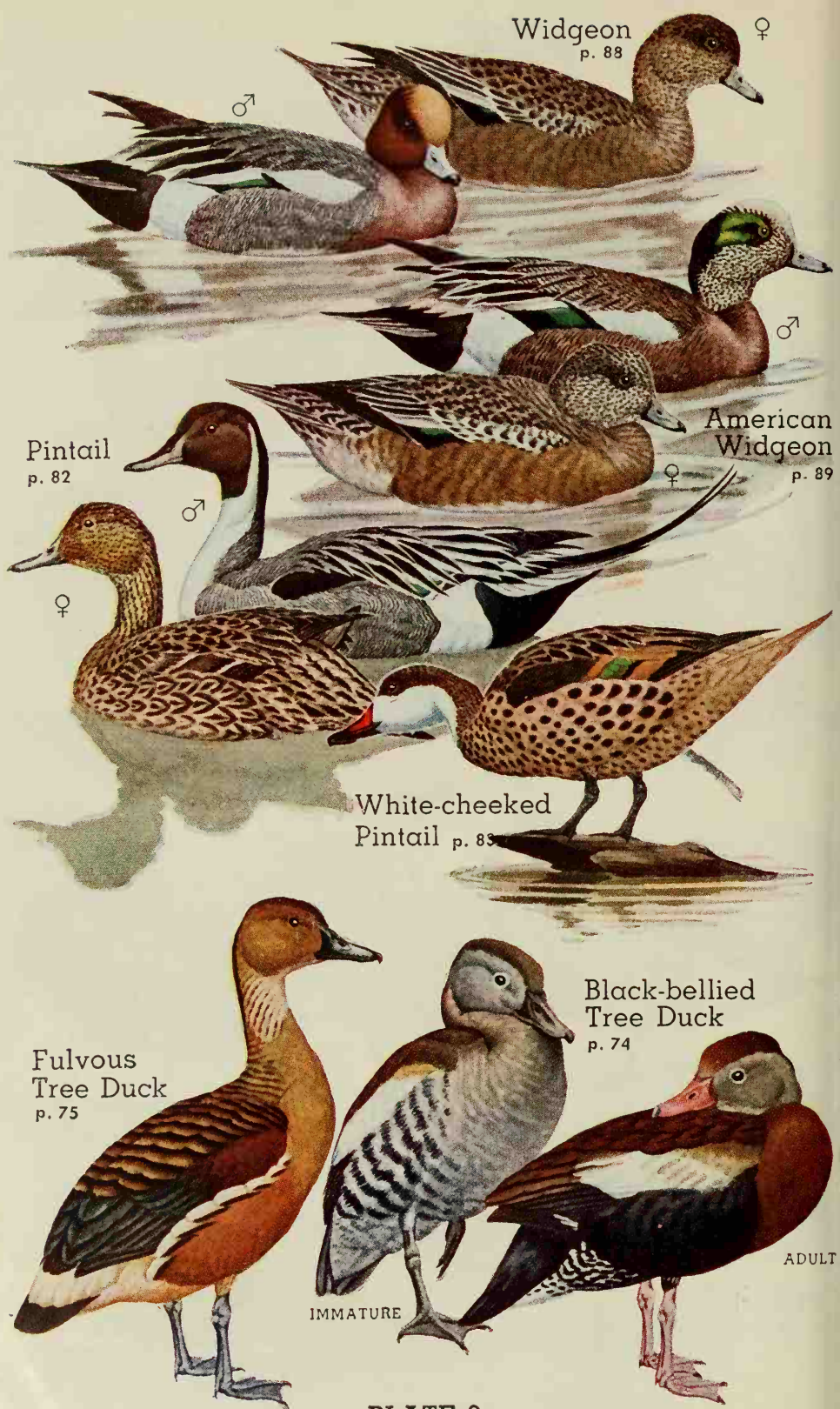
Cinnamon Teal p. 87

♂



Shoveler p. 90

♂



Widgeon
p. 88

♀

♂

♂

♀

Pintail
p. 82

♂

♀

American
Widgeon
p. 89

White-cheeked
Pintail p. 83

♂

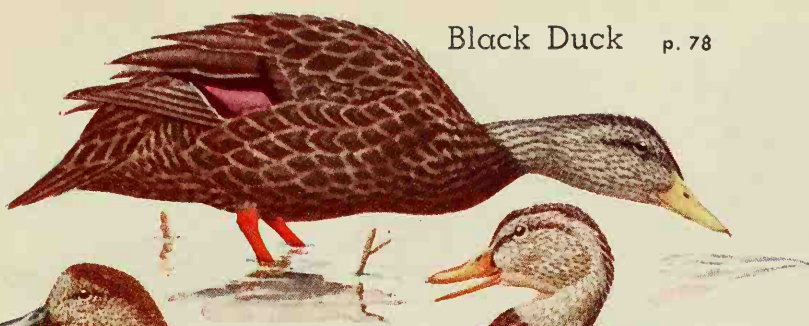
Black-bellied
Tree Duck
p. 74

Fulvous
Tree Duck
p. 75

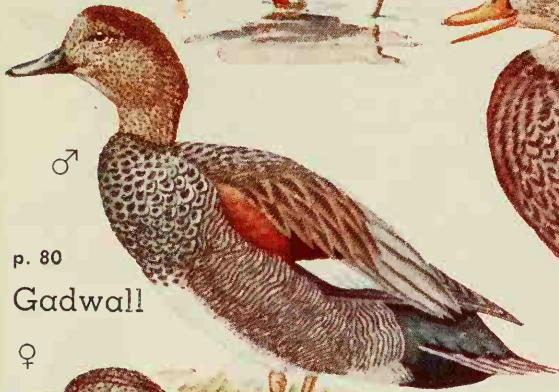
IMMATURE

ADULT

Black Duck p. 78



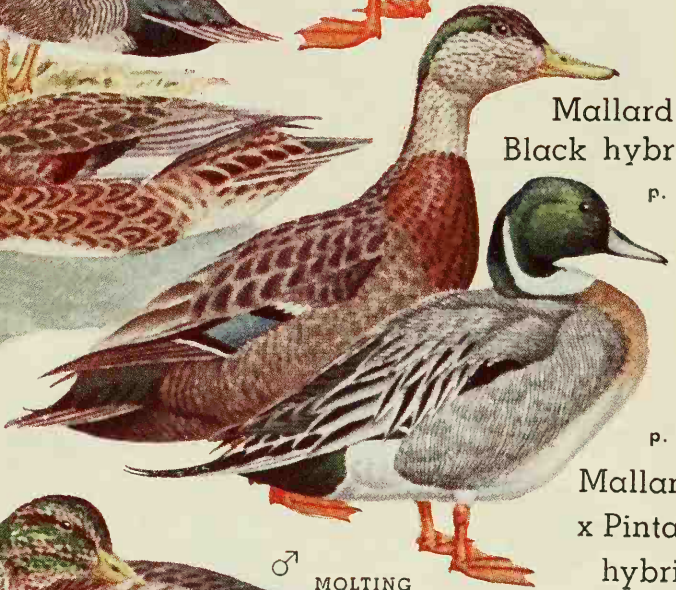
Mottled Duck
p. 80



p. 80
Gadwall

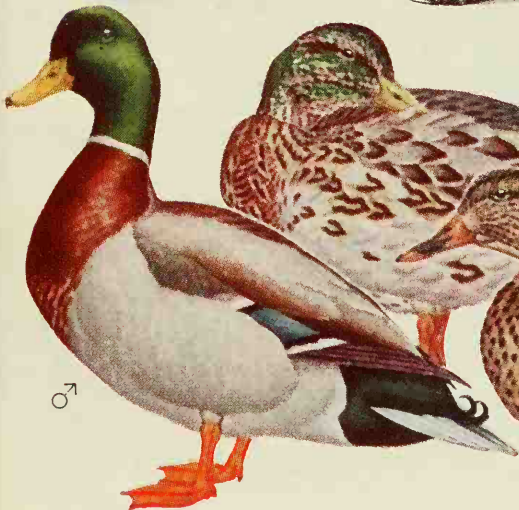


Mallard x
Black hybrid
p. 77



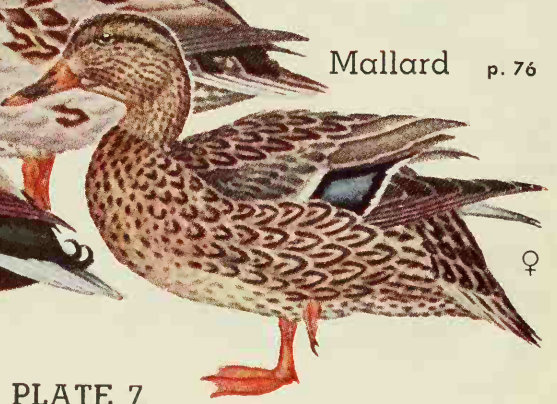
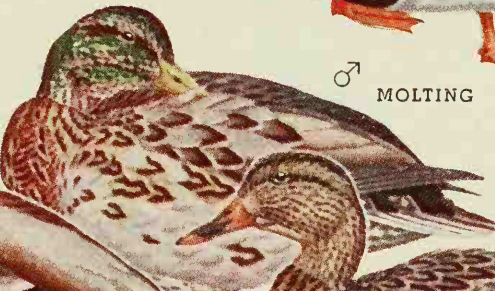
p. 77

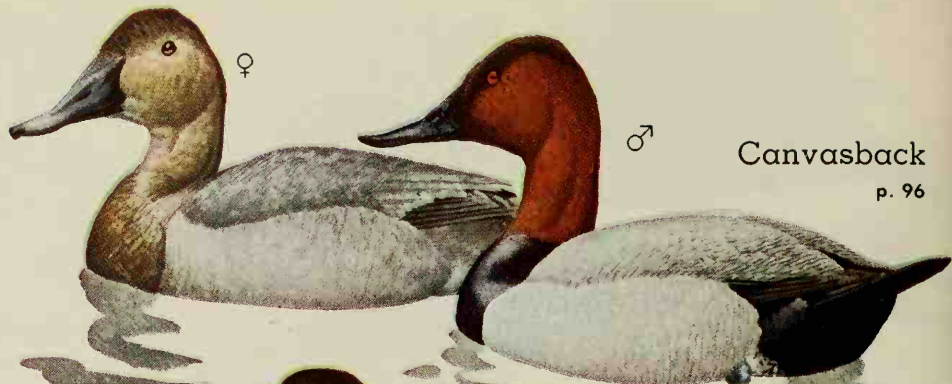
Mallard
x Pintail
hybrid



♂
MOLTING

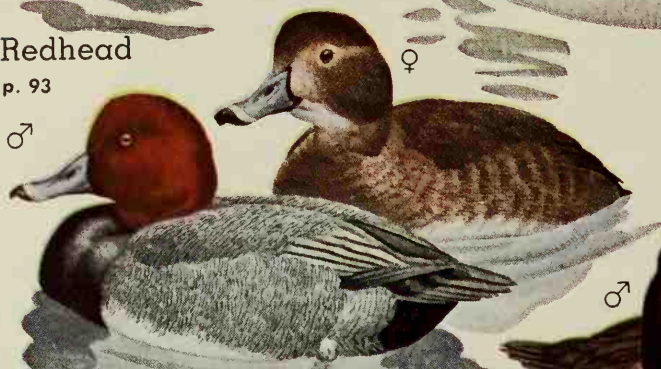
Mallard p. 76





Canvasback
p. 96

Redhead
p. 93



Ring-necked
Duck p. 95

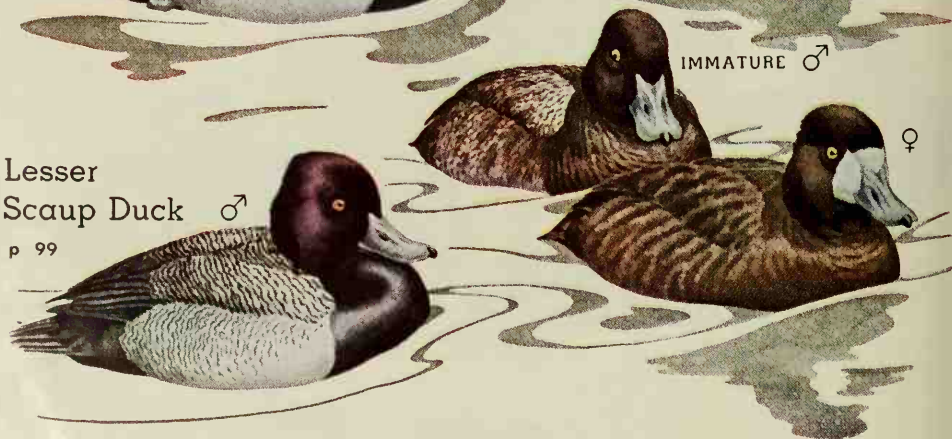


Scaup Duck

p. 98



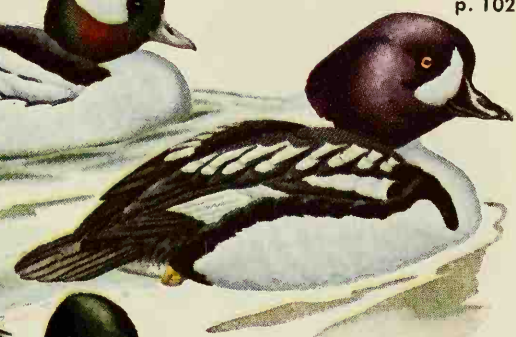
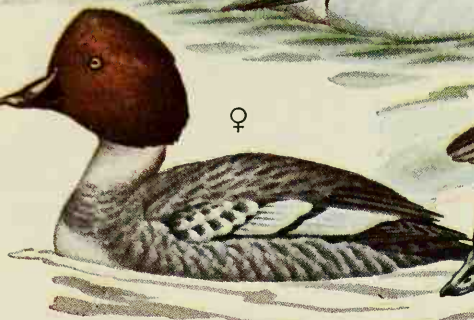
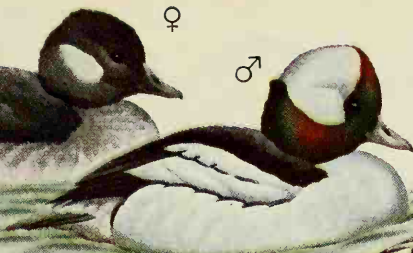
Lesser
Scaup Duck ♂
p. 99



Bufflehead
p. 103



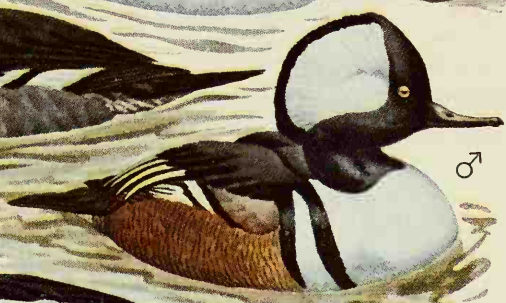
Barrow's Goldeneye
p. 102



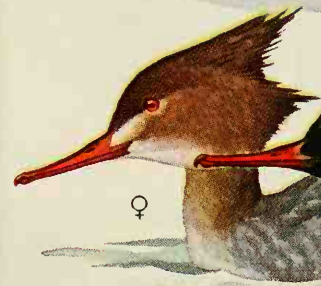
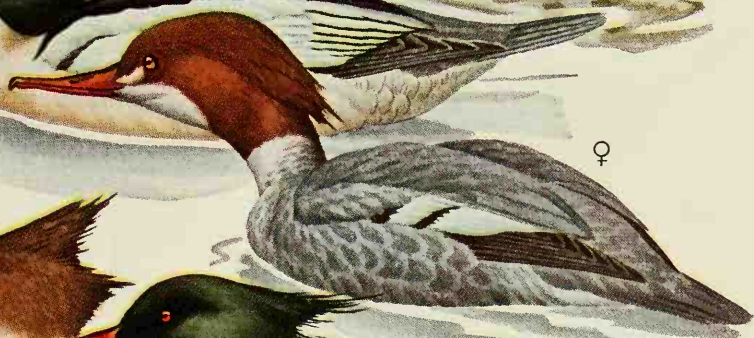
Goldeneye p. 100



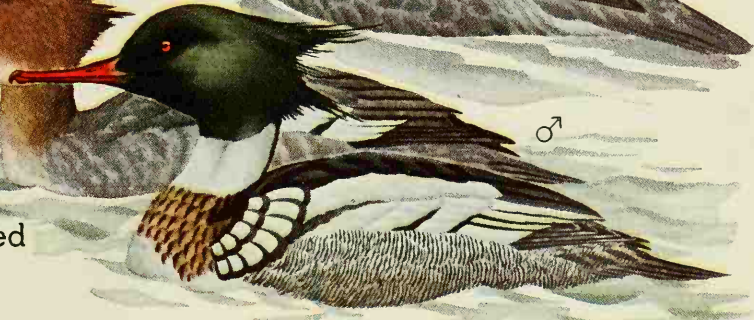
Hooded Merganser
p. 117

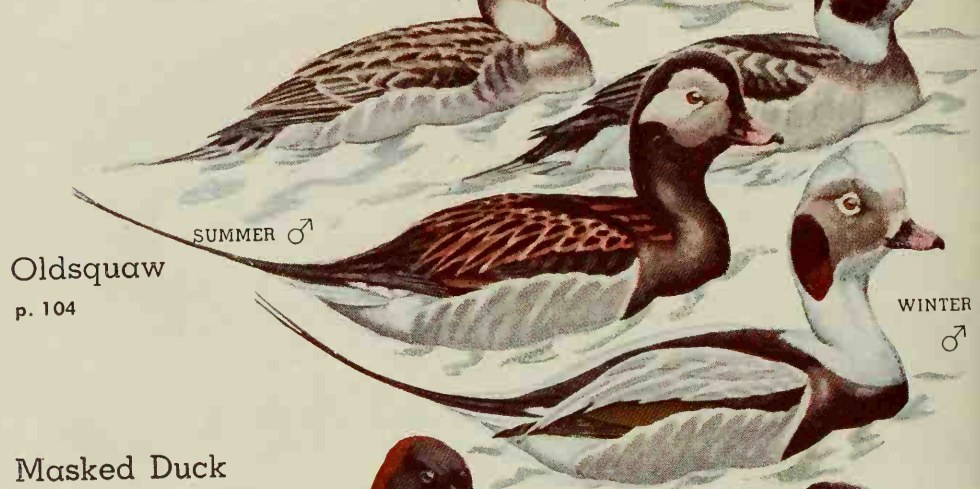
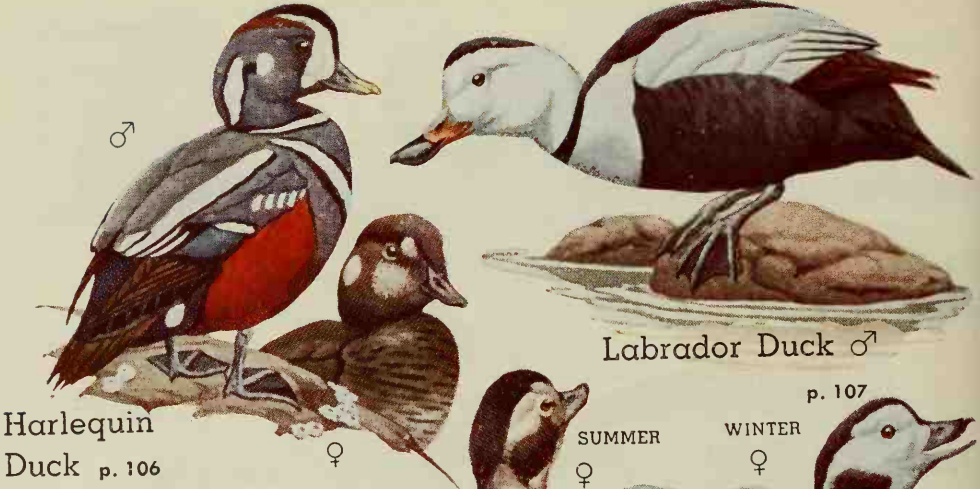


Merganser
p. 118



Red-breasted Merganser
p. 120







King Eider
p. 110

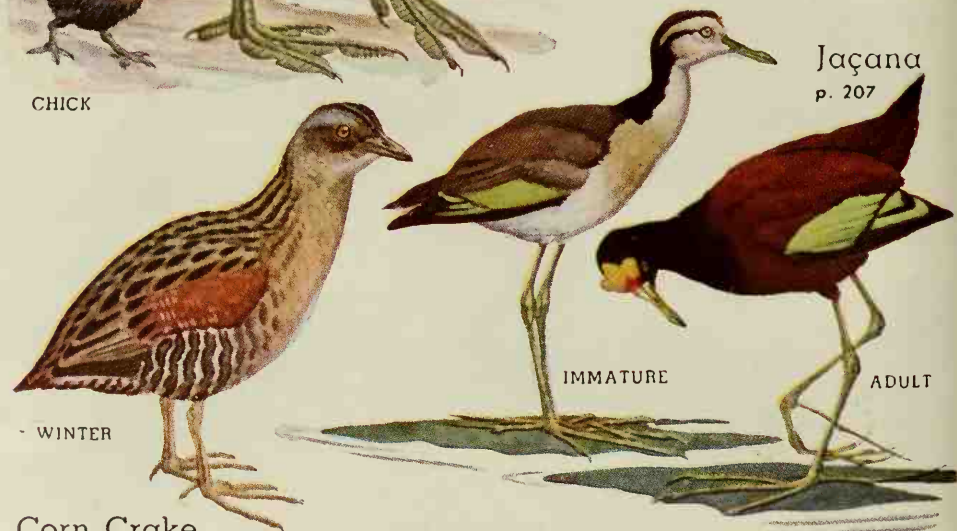
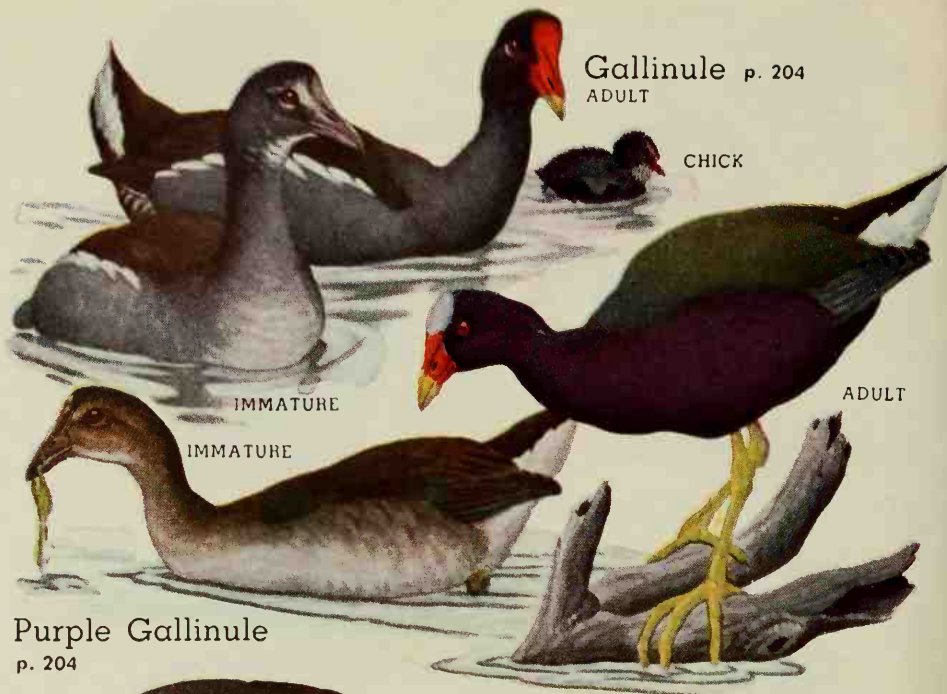
Eider
p. 108

IMMATURE

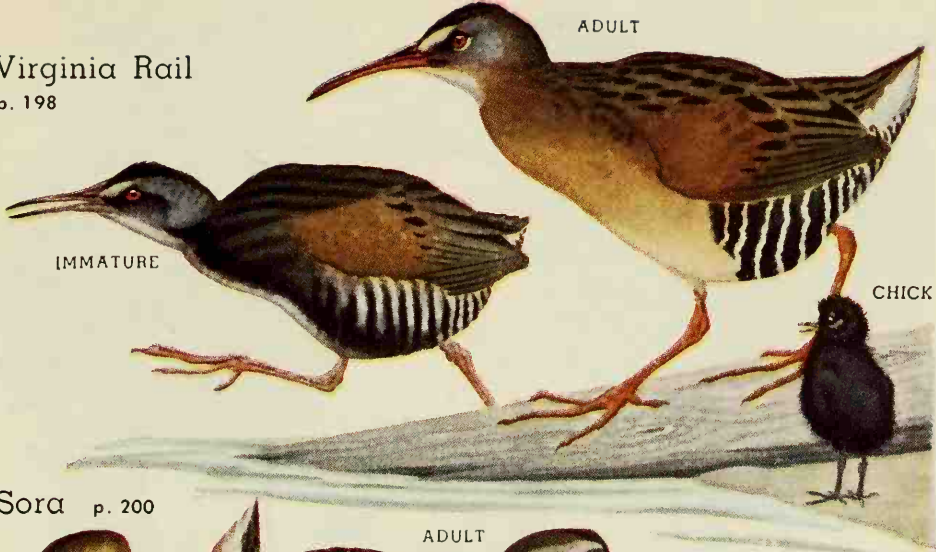
Surf Scoter
p. 112

White winged
Scoter
p. 111

Black Scoter
p. 114



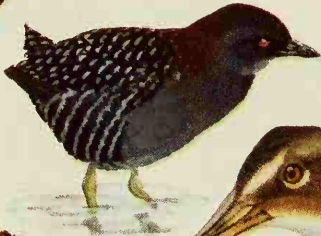
Virginia Rail
p. 198



Sora p. 200



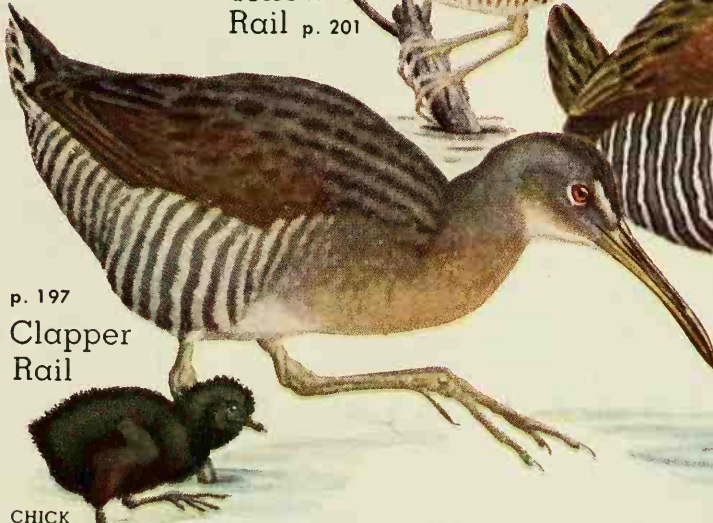
Black Rail
p. 202



Yellow Rail p. 201



p. 197
Clapper Rail



King Rail
p. 196



Reddish Egret

p. 43

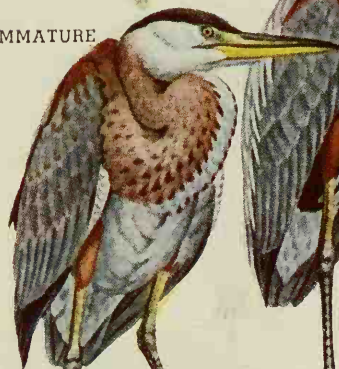
DARK PHASE



WHITE PHASE



IMMATURE



Great Blue Heron

p. 40

ADULT

Little Blue Heron

p. 45

MOLTING



ADULT

IMMATURE

Snowy Egret

p. 43



Wurde mann's Heron

p. 39

Egret

p. 42



Great White Heron

p. 38



ADULT

IMMATURE

ADULT

IMMATURE

Night Heron p. 47

ADULT

Yellow-crowned
Night Heron

p. 48

IMMATURE

Tricolored
Heron p. 44

Green
Heron

p. 46

ADULT

IMMATURE

American
Bittern

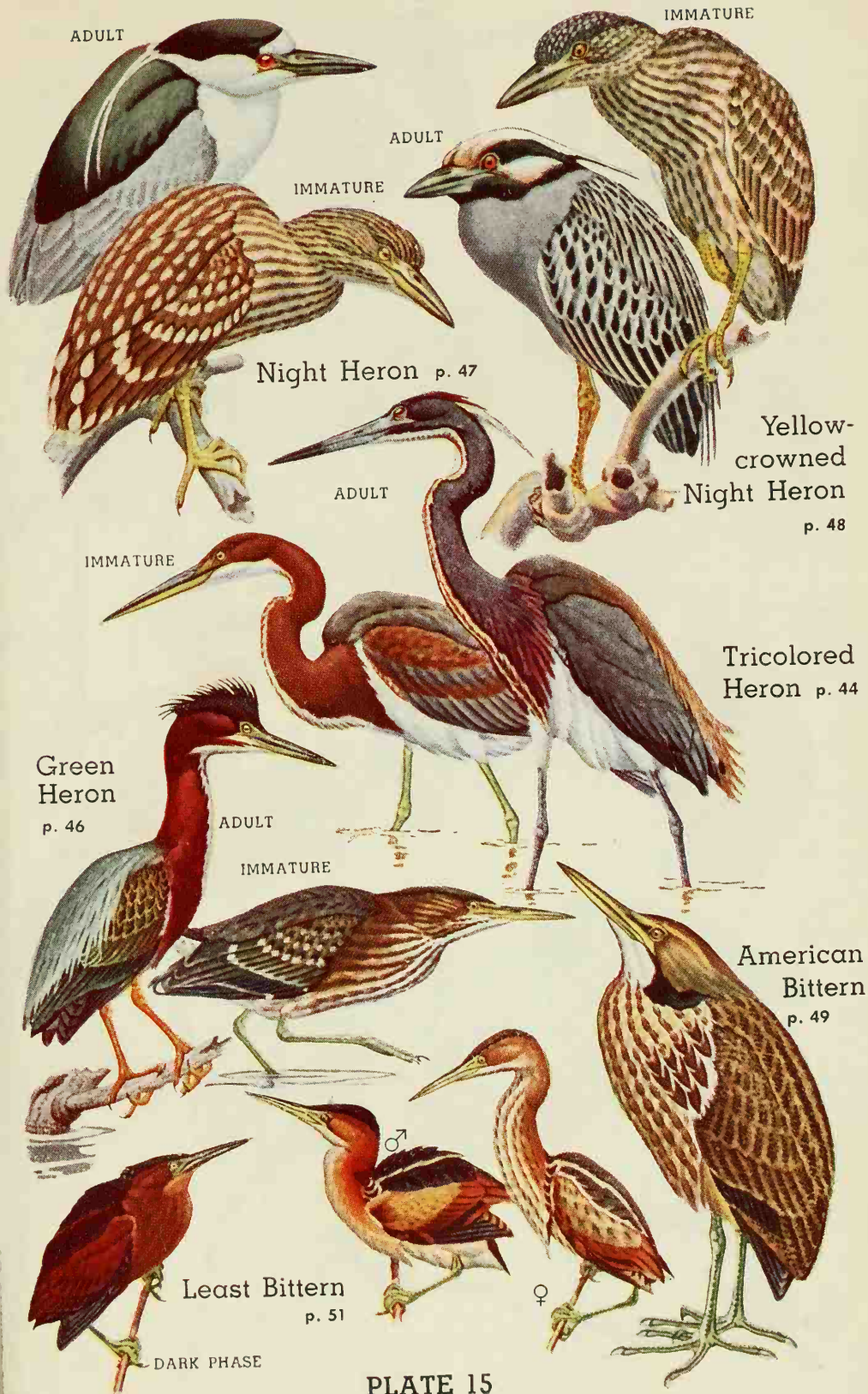
p. 49

Least Bittern

p. 51

DARK PHASE

PLATE 15



IMMATURE

ADULT

IMMATURE

White Ibis
p. 55

ADULT

Glossy Ibis
p. 54

IMMATURE

IMMATURE

ADULT

White-faced
Glossy Ibis
p. 55

Scarlet Ibis
p. 57

ADULT

IMMATURE

American Flamingo

p. 59

ADULT

Sandhill Crane

p. 192

IMMATURE

IMMATURE

Whooping Crane

p. 191

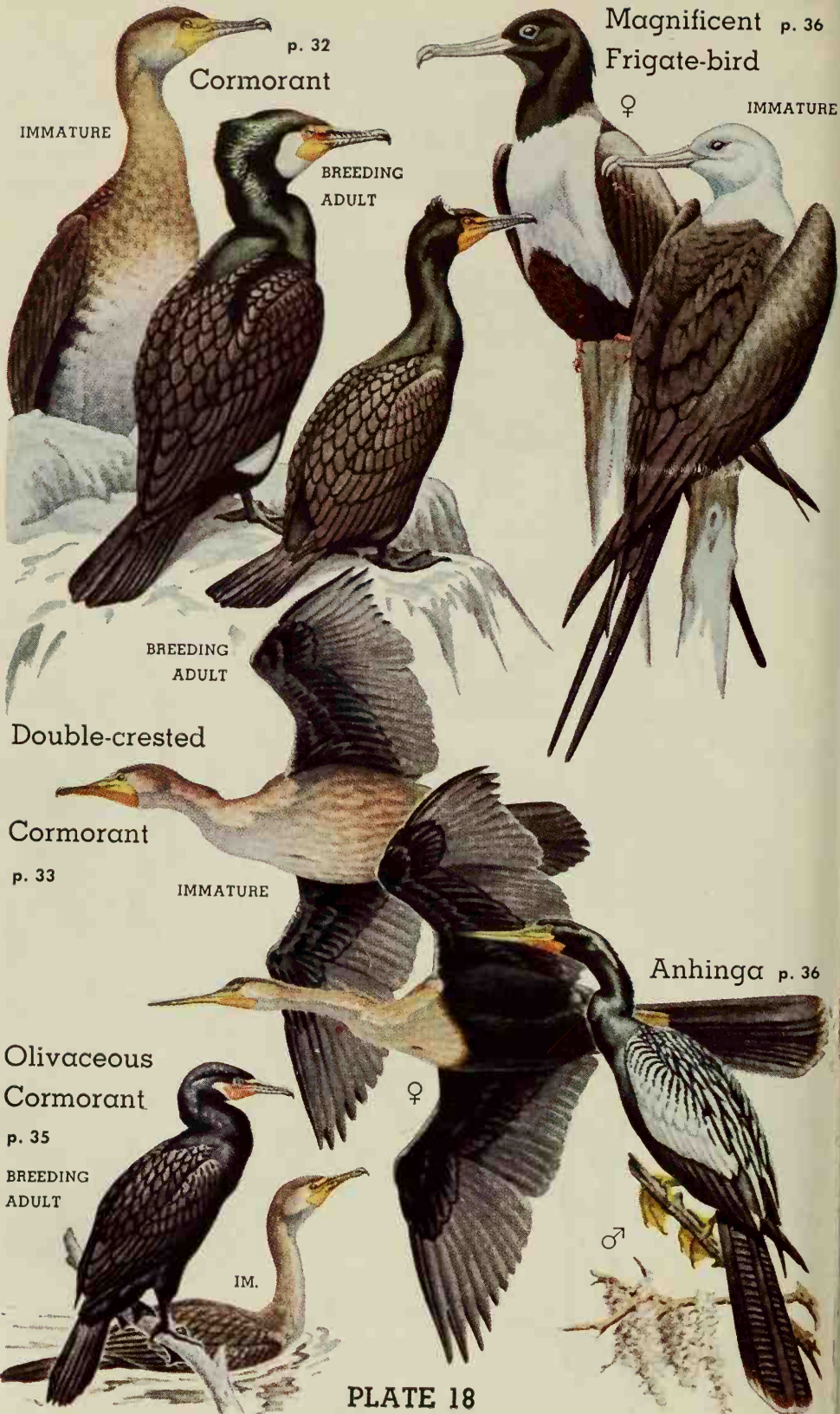
ADULT

Wood Ibis

p. 52

Limpkin

p. 194



p. 32

Cormorant

IMMATURE

BREEDING
ADULT

Magnificent p. 36

Frigate-bird

♀

IMMATURE

BREEDING
ADULT

Double-crested

Cormorant

p. 33

IMMATURE

Anhinga p. 36

Olivaceous
Cormorant

p. 35

BREEDING
ADULT

IM.

♀

♂

PLATE 18

Magnificent
Frigate-
bird

p. 36

IMMATURE

BREEDING ADULT

IMMATURE

ADULT

Blue-faced
Booby p. 28

White
Pelican

p. 25

Gannet

IMMATURE p. 31

IMMATURE

ADULT

Brown
Booby

p. 29

IMMATURE

ADULT

BROWN
PHASE

WHITE
PHASE

Red-footed
Booby p. 30

LIGHT PHASE

DARK PHASE

Bermuda
Petrel

p. 19

Fulmar

p. 20

Storm
Petrel

p. 22

Black-capped
Petrel

p. 18

Frigate
Petrel

p. 23

Leach's Petrel

p. 21

Wilson's
Petrel

p. 22

Common
Shearwater

p. 14

Great
Shearwater

p. 16

p. 13

Sooty Shearwater

Dusky Shearwater

p. 15

Cinereous
Shearwater

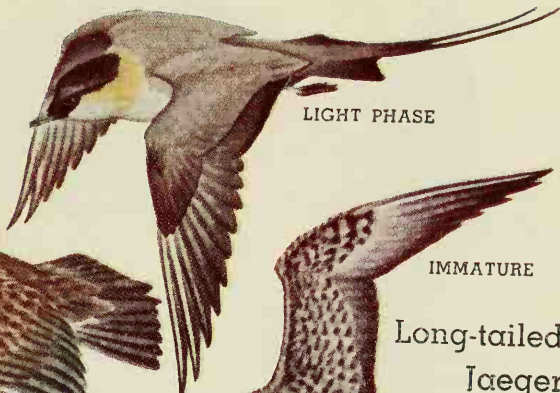
p. 17

PLATE 20



Skua

p. 261



LIGHT PHASE



IMMATURE

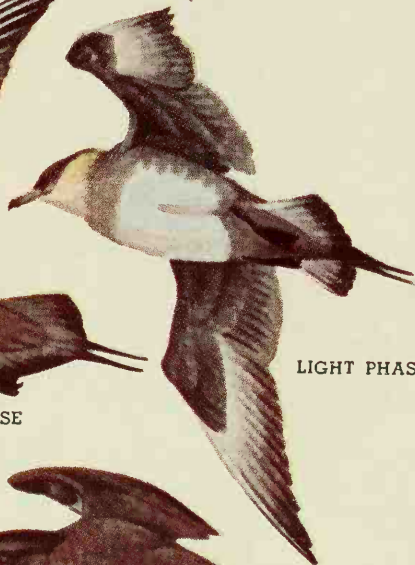
Long-tailed
Jaeger

p. 260

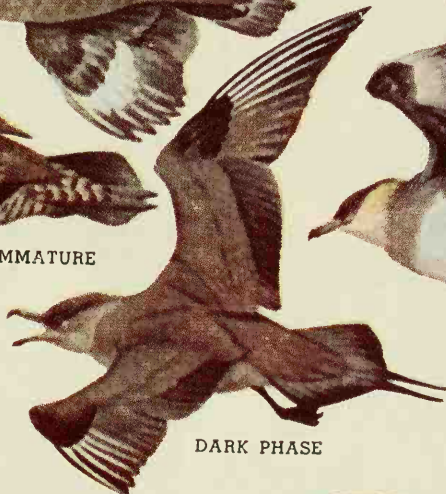
JUVENILE



IMMATURE



LIGHT PHASE



DARK PHASE

p. 259

Parasitic Jaeger



IMMATURE



DARK PHASE

LIGHT PHASE

p. 258

Pomarine Jaeger

IMMATURE



ADULT
SUMMER

ADULT
WINTER

JUVENILE

JUVENILE

JUVENILE

ADULT
SUMMER

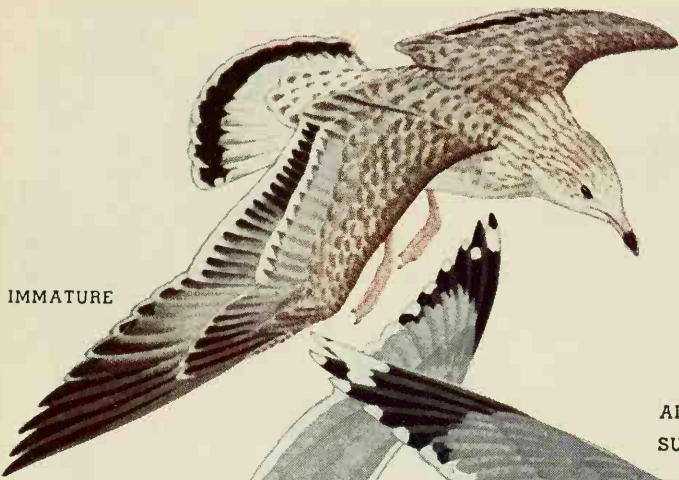
Iceland
Gull p. 265

IMMATURE

Glaucous Gull p. 264

ADULT
SUMMER

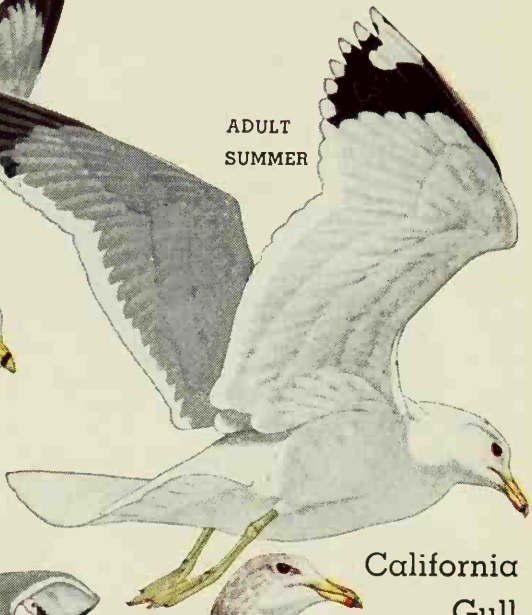
IMMATURE



Ring-billed
Gull p. 271

ADULT
SUMMER

ADULT
SUMMER



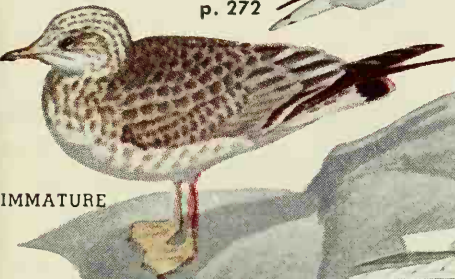
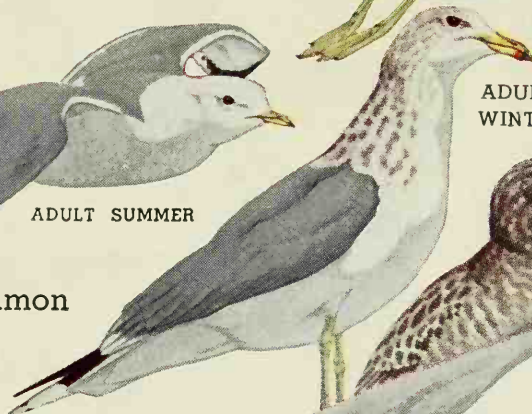
California
Gull
p. 270

ADULT
WINTER

ADULT SUMMER

IM.

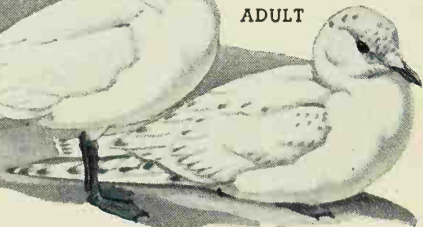
Common
Gull
p. 272



IMMATURE

Ivory Gull
p. 279

ADULT



IMMATURE

Black-headed Gull p. 273

ADULT WINTER

ADULT SUMMER

IMMATURE

ADULT WINTER

Laughing Gull

p. 275

ADULT
SUMMER

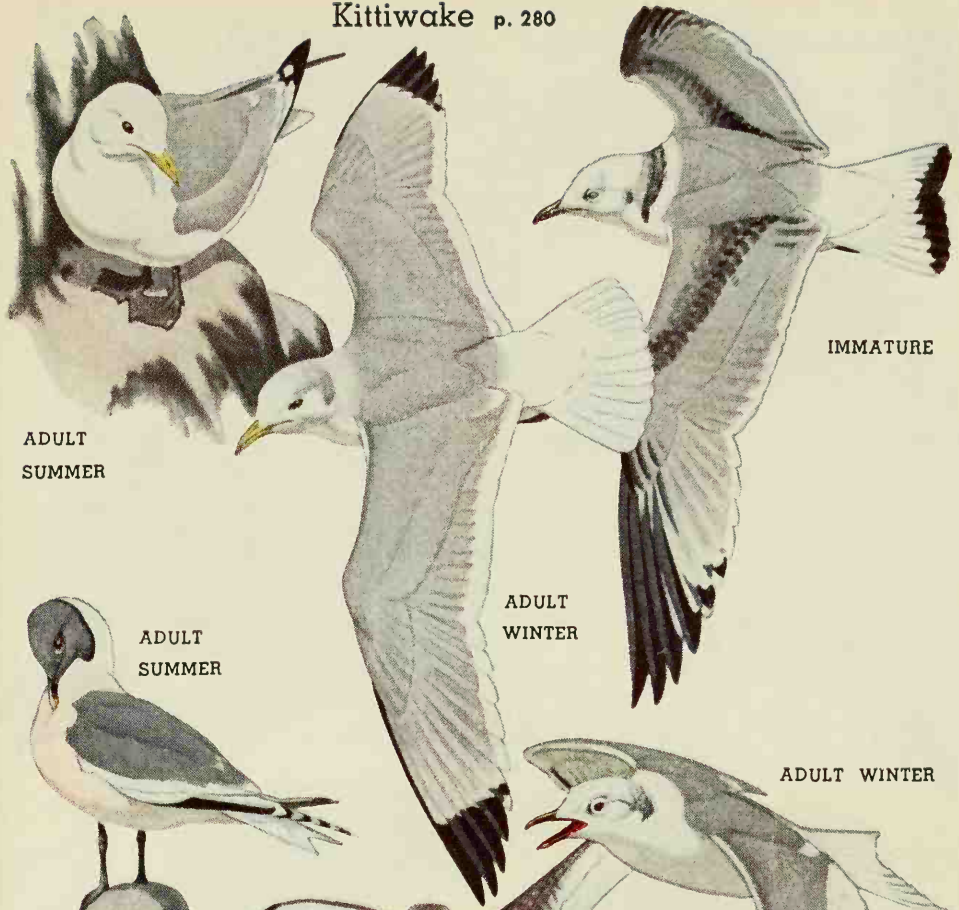
IMMATURE

Franklin's
Gull p. 276

ADULT
WINTER

ADULT SUMMER

IMMATURE



ADULT
SUMMER

IMMATURE

ADULT
WINTER

ADULT
SUMMER

ADULT WINTER

Sabine's
Gull p. 282



IMMATURE

ADULT
WINTER

IMMATURE

ADULT
SUMMER

Bonaparte's Gull
p. 277





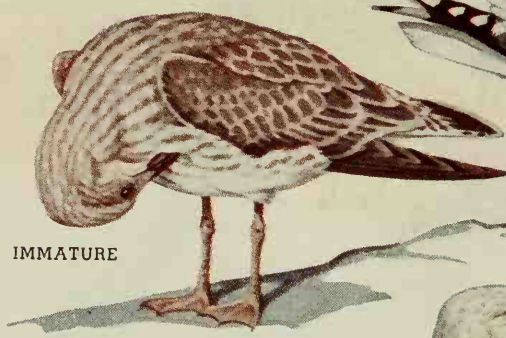
Little Gull

p. 278



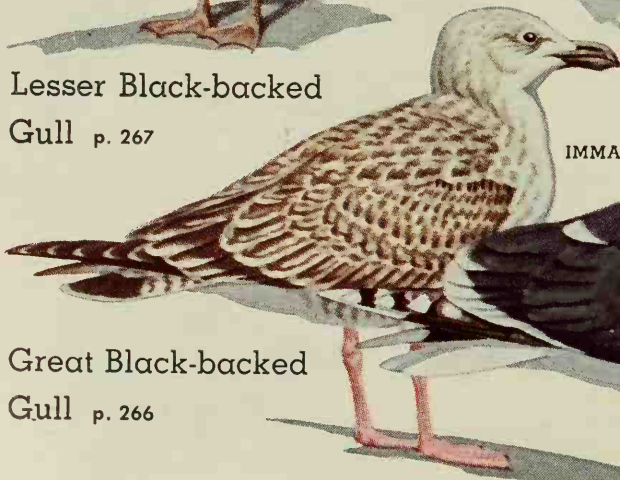
Ross' Gull

p. 281



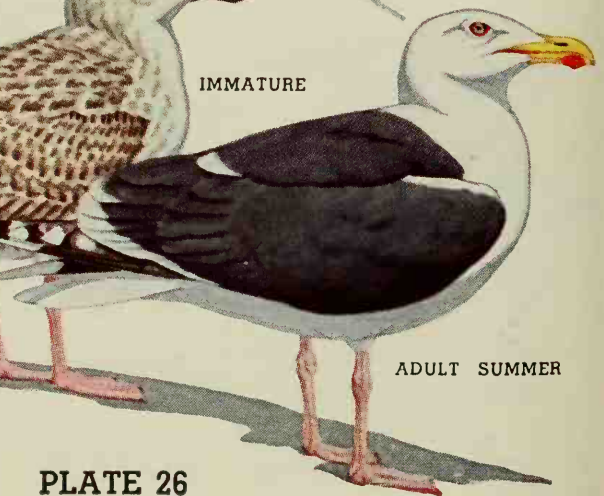
Lesser Black-backed Gull

p. 267



Great Black-backed Gull

p. 266



Yellow-billed Tropic-bird

p. 24

IMMATURE

ADULT

ADULT

Bridled Tern

p. 290

ADULT
WINTER

IMMATURE

ADULT
MOLTING

ADULT

Sooty Tern

p. 289

IMMATURE

Noddy Tern

p. 295

ADULT

IMMATURE

IMMATURE

Black Tern

Common Tern

p. 285

JUVENILE

SUMMER

WINTER

p. 287

Arctic Tern

SUMMER

SUMMER

Forster's Tern

p. 284

Roseate Tern

p. 288

SUMMER

WINTER

WINTER

Sandwich Tern p. 292

SUMMER

JUVENILE

WINTER

SUMMER

Caspian Tern

p. 293

SUMMER

WINTER

JUVENILE

JUVENILE

WINTER

Least Tern

p. 290

JUVENILE

Gull-billed Tern

p. 283

SUMMER

Mountain Plover

p. 215

SPRING

FALL

Killdeer

p. 214

FALL

Turnstone

p. 216

SPRING

Thick-billed Plover

p. 213

FALL

SPRING

Snowy Plover

p. 212

FALL

SPRING

Piping Plover

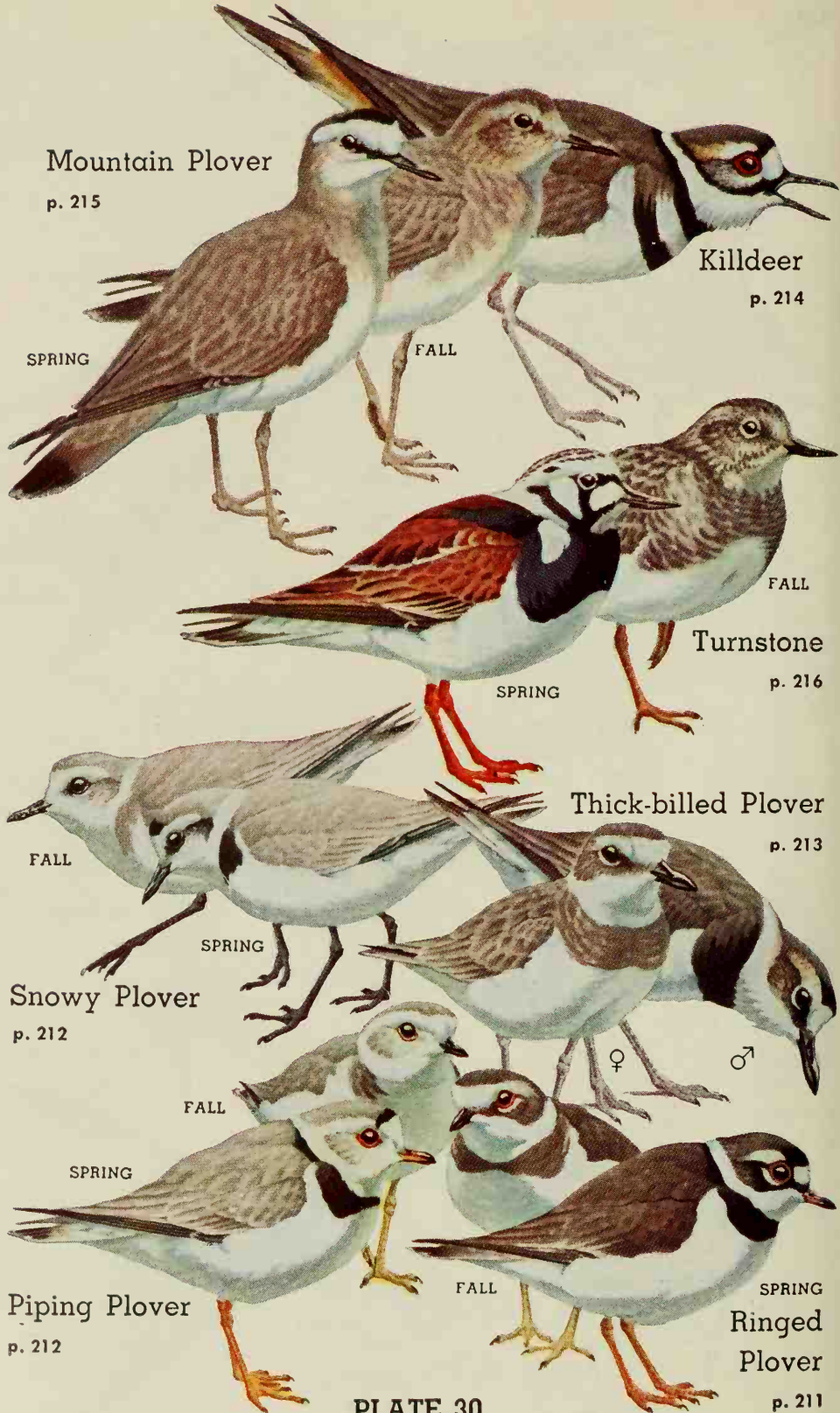
p. 212

FALL

SPRING

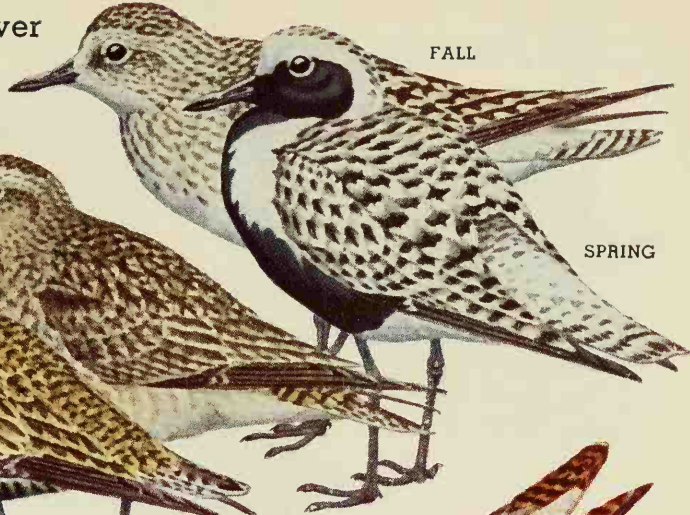
Ringed Plover

p. 211



Black-bellied Plover

p. 218



FALL

FALL

SPRING

SPRING

American Golden Plover

p. 217



Ruff p. 250

SPRING

Reeve

p. 250

FALL

Purple Sandpiper

p. 234

FALL

SPRING



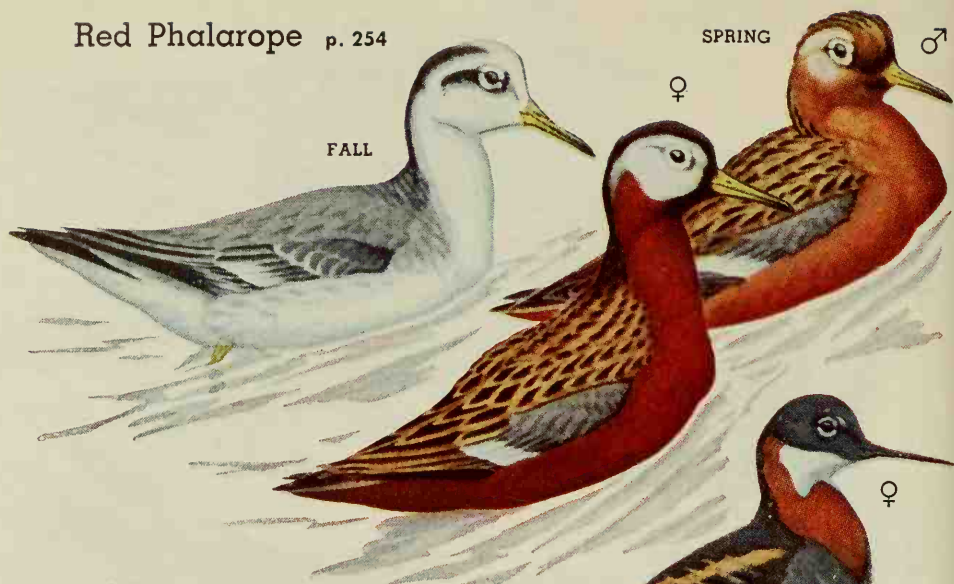
Lapwing

p. 210

FALL

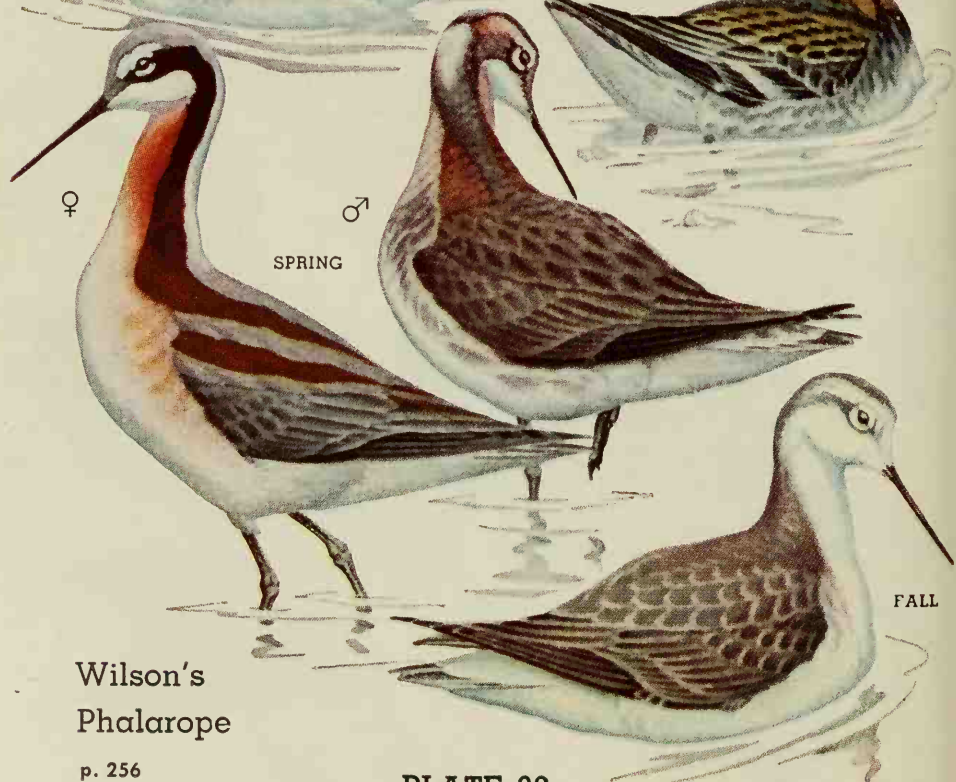
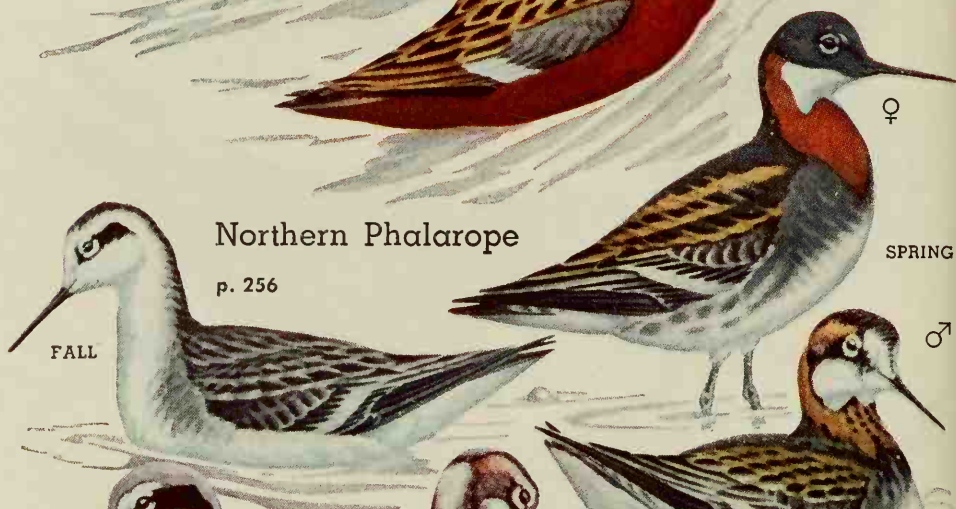


Red Phalarope p. 254



Northern Phalarope

p. 256



Wilson's
Phalarope

p. 256

American Woodcock

p. 219

Common Snipe

p. 222

Stilt Sandpiper

p. 243

SPRING

FALL

SPRING

FALL

Dowitcher

p. 241

Buff-breasted Sandpiper

p. 246

FALL

SPRING

Knot

p. 233

Marbled Godwit

p. 247

Hudsonian

Godwit p. 249

SPRING

FALL

Long-billed
Curlew

p. 223

Eskimo
Curlew

p. 225

Whimbrel

p. 224

p. 208

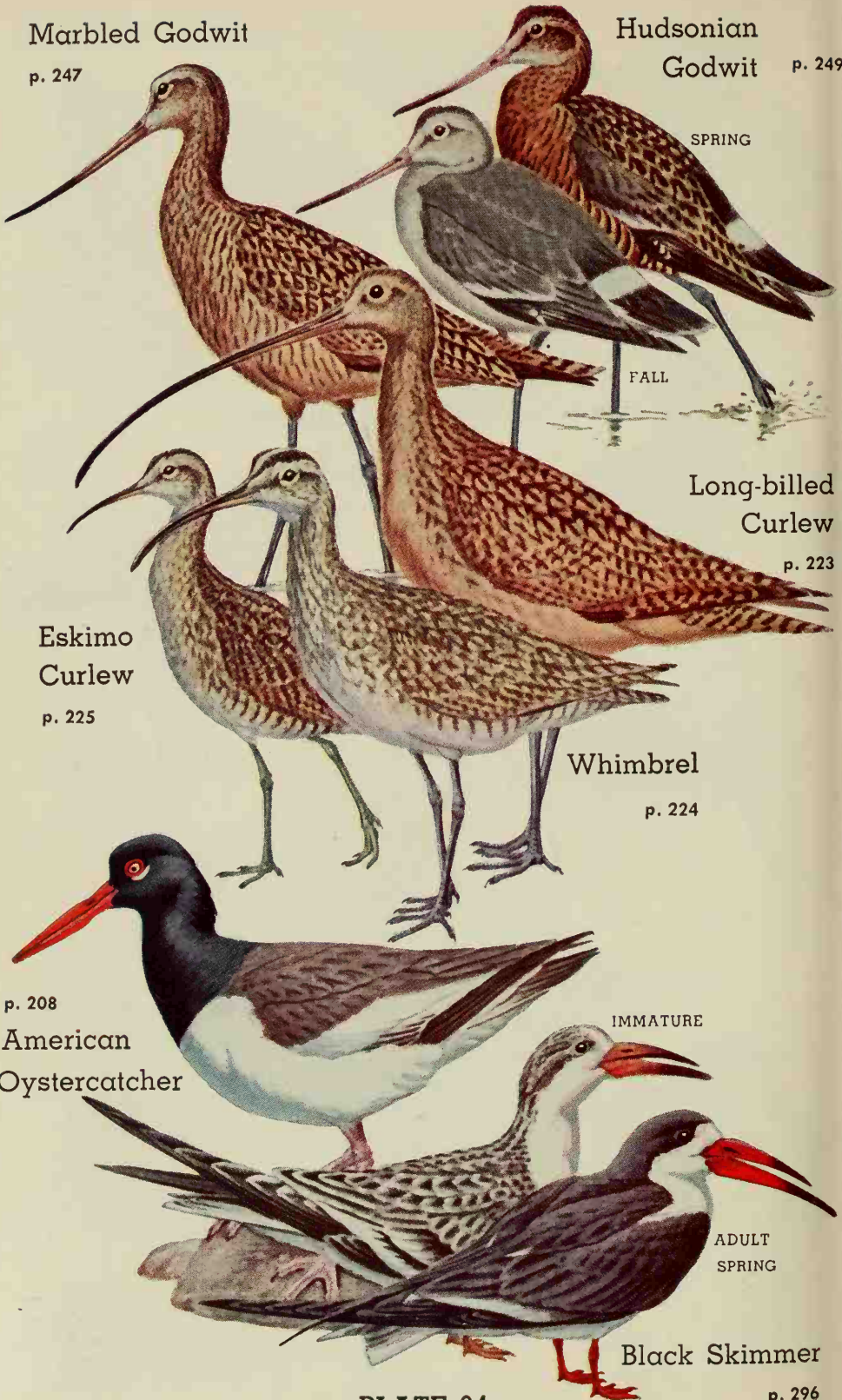
American
Oystercatcher

IMMATURE

ADULT
SPRING

Black Skimmer

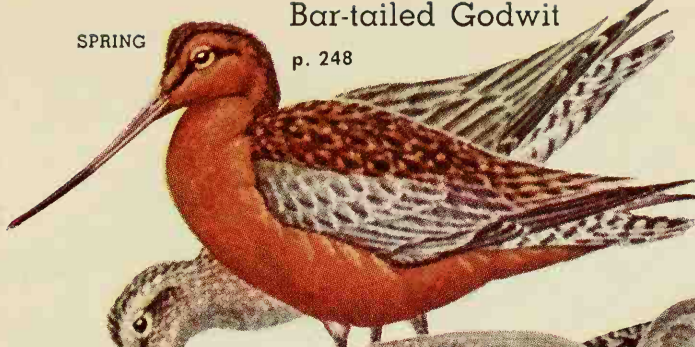
p. 296



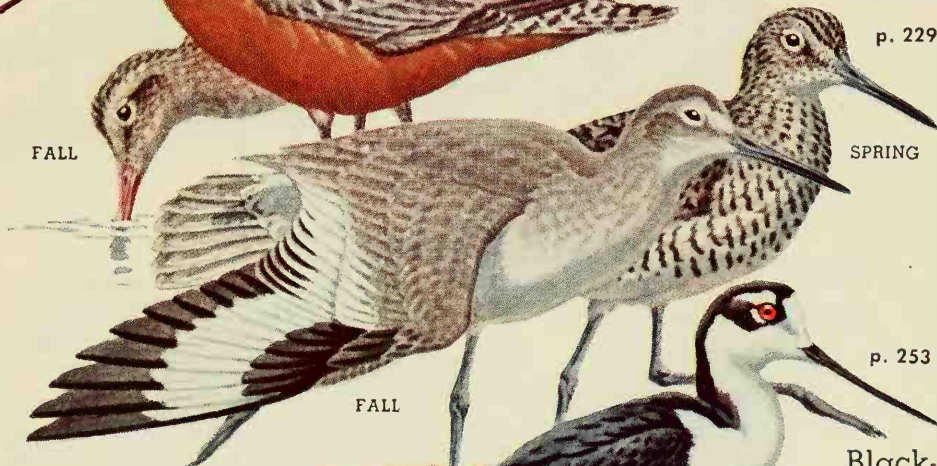
SPRING

Bar-tailed Godwit

p. 248



FALL



Willet

p. 229

SPRING

FALL

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Black-necked Stilt

Greater Yellowlegs

p. 231

American Avocet

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Lesser Yellowlegs

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Upland Plover

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Solitary Sandpiper

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SPRING

White-rumped Sandpiper

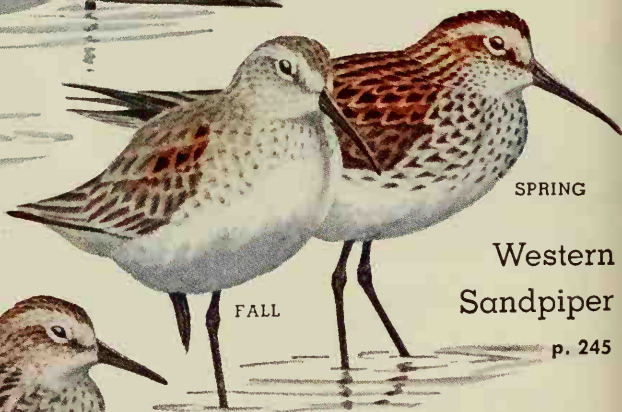
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FALL



Baird's Sandpiper

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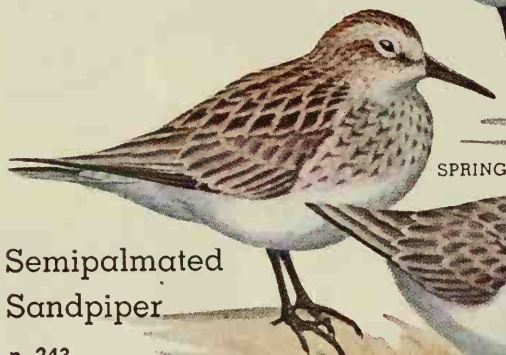


SPRING

Western Sandpiper

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FALL



SPRING

Semipalmated Sandpiper

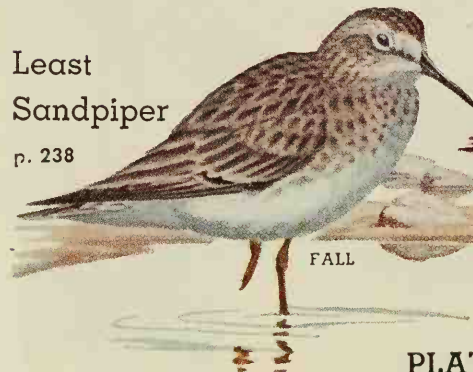
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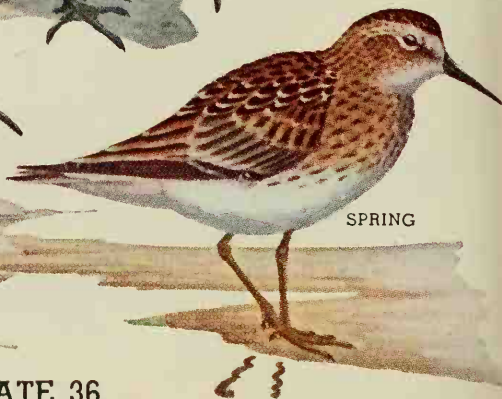
FALL

Least Sandpiper

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FALL



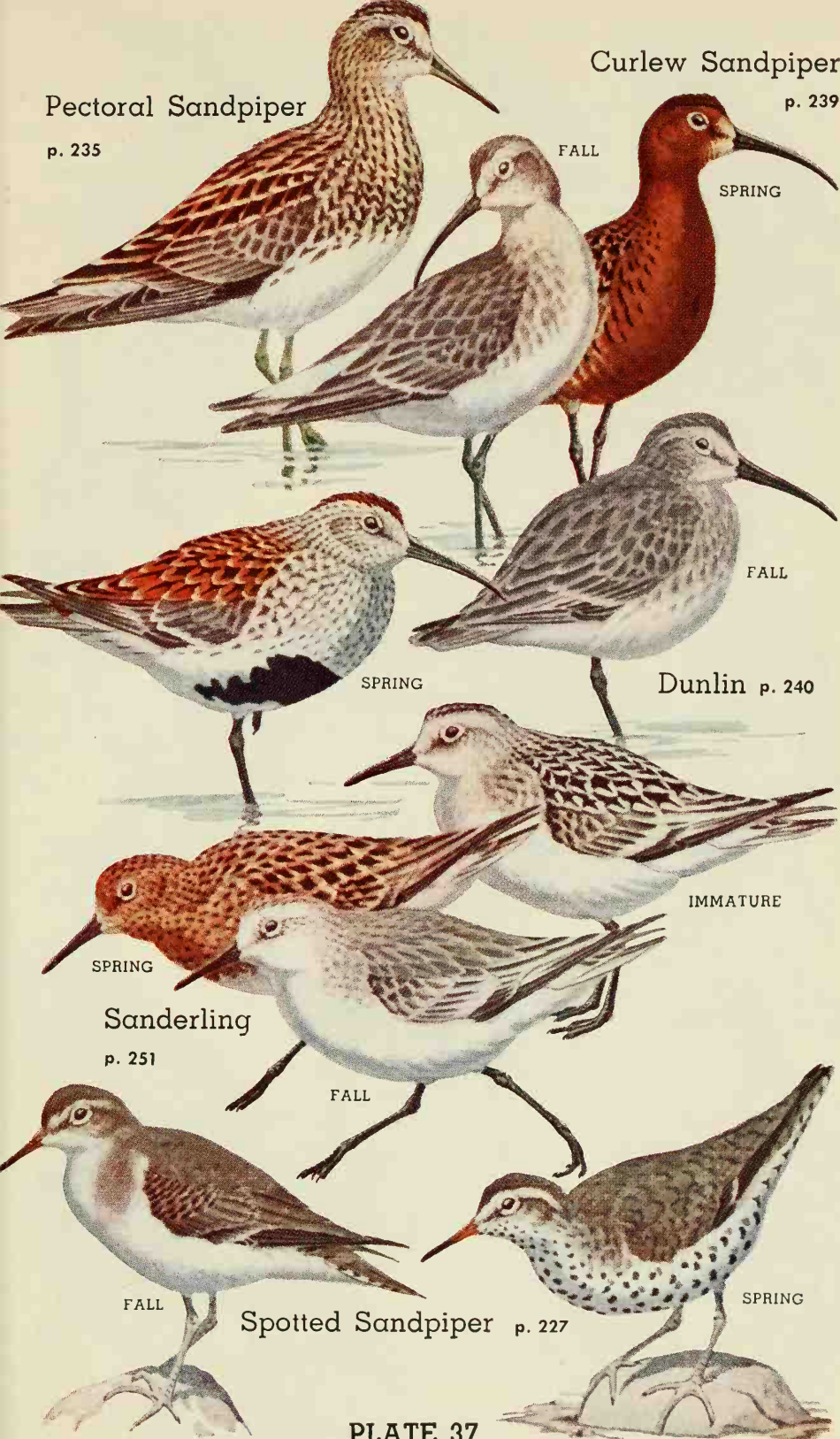
SPRING

Pectoral Sandpiper

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Curlew Sandpiper

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Puffin

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SUMMER

SUMMER

Dovekie

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WINTER

Great Auk

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WINTER

IMMATURE

SUMMER

Thick-billed Murre

p. 301

IMMATURE

WINTER

ADULT

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Razor-billed Auk

RINGED
PHASE

SUMMER

Murre

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SUMMER

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Black Guillemot

WINTER

WINTER

IMMATURE

Mississippi Kite

p. 129



ADULT



♂



IMMATURE

Everglade Kite

p. 130



♀



ADULT

♀

White-tailed Kite

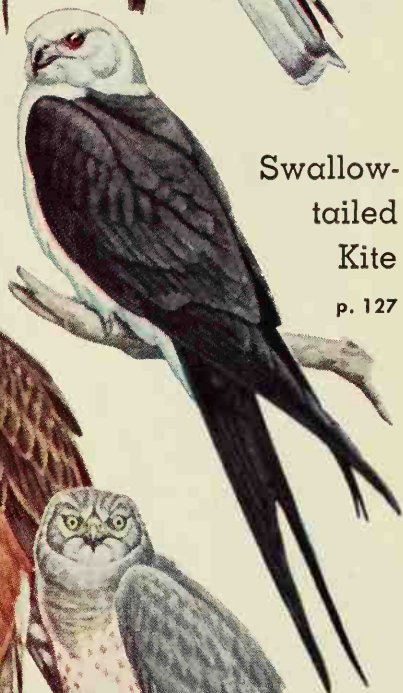
p. 126



ADULT



IMMATURE



Swallow-tailed Kite

p. 127

IMMATURE

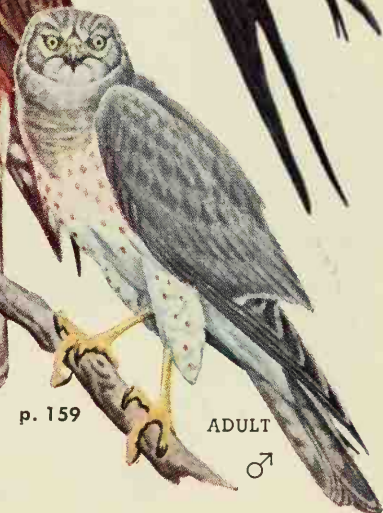
♀



Marsh

Hawk

p. 159



ADULT

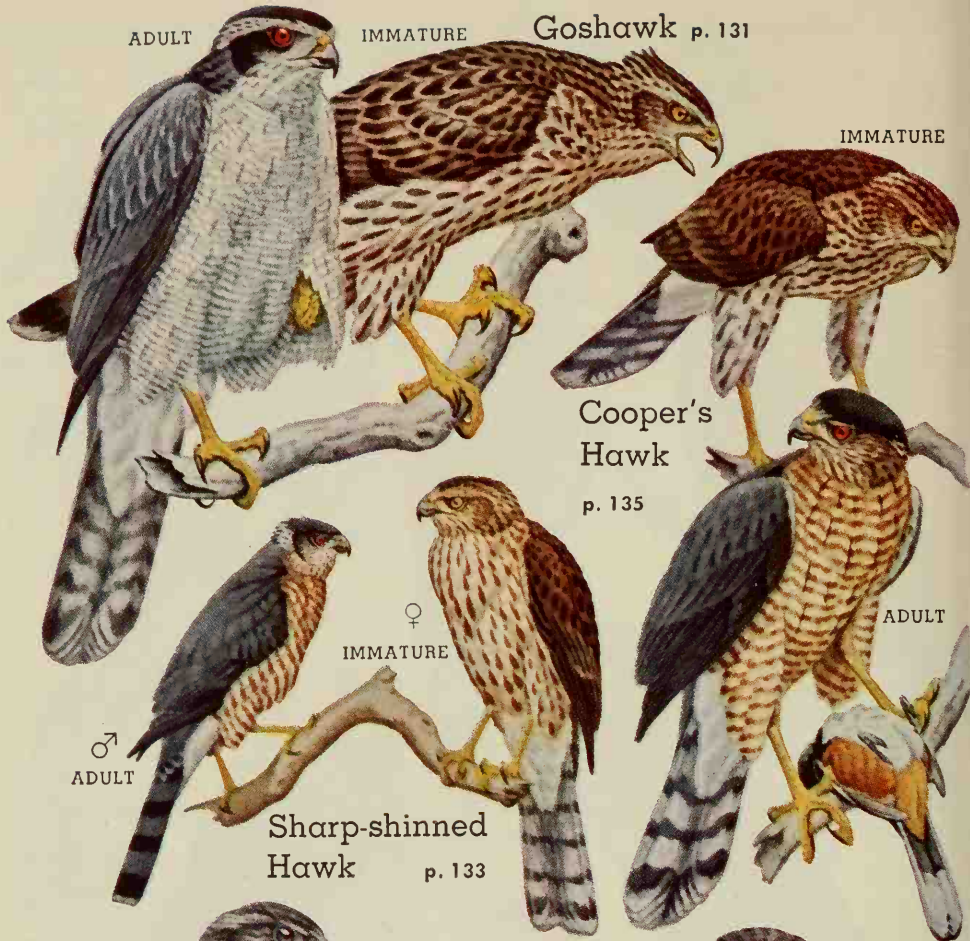
♂

ADULT

IMMATURE

Goshawk p. 131

IMMATURE



Cooper's
Hawk

p. 135

IMMATURE

ADULT

Sharp-shinned
Hawk

p. 133

BLACK PHASE

Gyr Falcon

p. 164

GRAY
PHASE

WHITE
PHASE

Prairie
Falcon

p. 165



ADULT

IMMATURE



Peregrine
Falcon

p. 167



Sparrow
Hawk

p. 171



IMMATURE



IMMATURE

ADULT

Pigeon
Hawk

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ADULT



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Aplomado
Falcon

DARK PHASE

Red-tailed

Hawk p. 136

Harlan's
Hawk

p. 139

IMMATURE

NORMAL
PHASE

DARK PHASE

LIGHT PHASE

IMMATURE

Gray Hawk

p. 151

ADULT

ADULT

IMMATURE

Red-shouldered
Hawk p. 140

ADULT

IMMATURE

PLATE 42

Broad-winged
Hawk p. 141



Swainson's
Hawk p. 143

NORMAL
PHASE

DARK
PHASE

IMMATURE

Rough-
legged
Hawk
p. 148

DARK
PHASE

NORMAL PHASE

DARK PHASE

IMMATURE

Ferruginous
Rough-legged
Hawk p. 149

NORMAL
PHASE

ADULT

White-tailed
Hawk p. 145

PLATE 43





p. 154

ADULT

Golden Eagle



Bald Eagle

p. 157

ADULT

IMMATURE



Sea Eagle p. 156

Zone-tailed Hawk

p. 144



IMMATURE



ADULT



Osprey p. 160



ADULT

IMMATURE

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Harris' Hawk



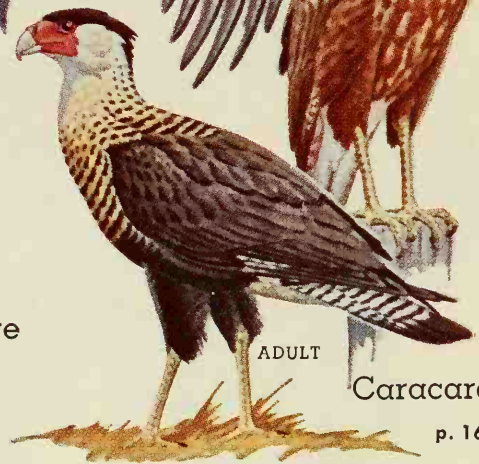
ADULT

IMMATURE

IMMATURE



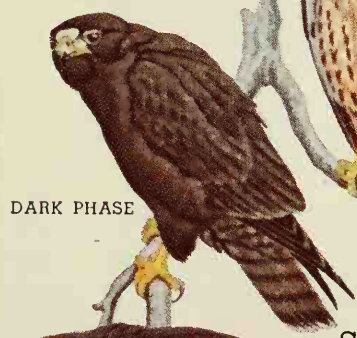
Black Vulture



ADULT

Caracara

IMMATURE

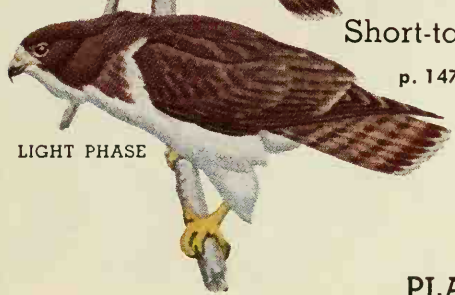


DARK PHASE



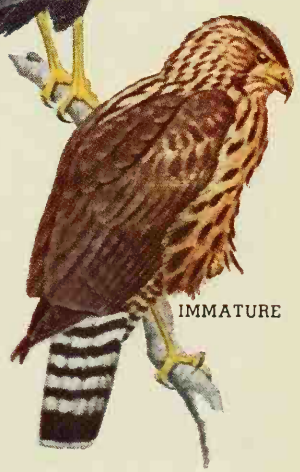
ADULT

Black Hawk



LIGHT PHASE

Short-tailed Hawk



IMMATURE

Pheasant

p. 186

♂

♀

p. 173

Chachalaca

Turkey p. 188

Sharp-tailed
Grouse p. 181

Prairie Chicken

p. 179

Ruffed Grouse

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Spruce
Grouse

p. 174

♂

♀

Willow Ptarmigan

p. 177



WINTER

SPRING

♀

FALL

♂

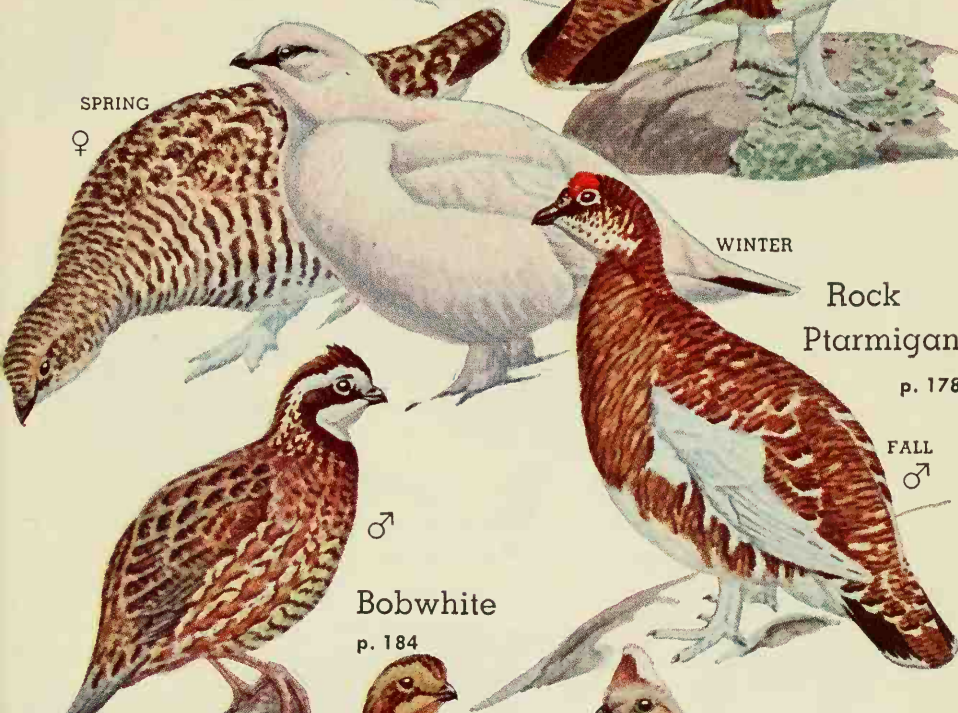
SPRING

♀

WINTER

Rock Ptarmigan

p. 178



FALL

♂

Bobwhite

p. 184



♂

♀

Scaled Quail

p. 185



Partridge

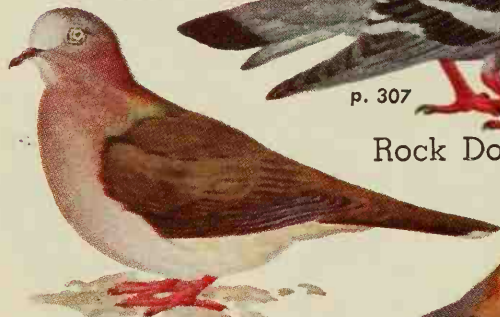
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Red-billed Pigeon

p. 306



White-crowned Pigeon p. 305

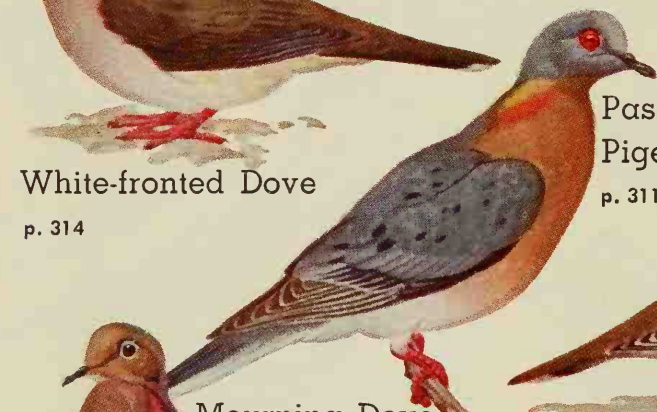


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Rock Dove

White-fronted Dove

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Passenger Pigeon

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Mourning Dove

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Inca Dove

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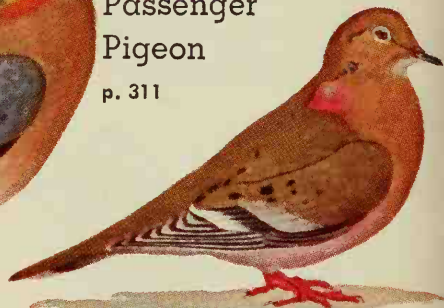
Key West Quail Dove

p. 315



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Ground Dove



Zenaida Dove

p. 308

White-winged Dove



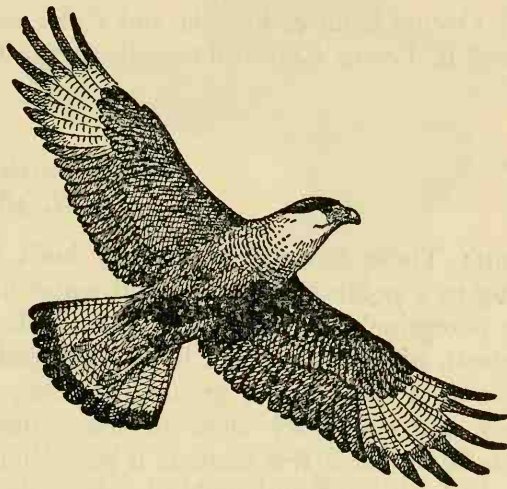
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FALCONS and ALLIES**Family Falconidae**

Caracara*
(Mexican Eagle)

Polyborus cheriway—~~45~~
L. 23; W. 48

IDENTIFICATION: This bird has a big, long neck, remarkably long legs, and a long tail. In any plumage the centrally pale primaries and pale tail with a dark terminal band are distinctive.



HABITS: This handsome bird is the national emblem of our neighbor, the Republic of Mexico, and appears on its seal with a rattlesnake in its mouth. As its long legs suggest, it is largely terrestrial, but it has a fast, direct flight, deep wing-beats alternating with short sails. Generally it flies close to the ground, but there are times when it circles and soars like a vulture. Caracaras are usually seen in pairs and are seldom found far from open country, where they feed on a variety of animal life as well as on carrion—their staple food when it is available. The bird is in fact known in some places as “king of the vultures,” as it will keep vultures away from a carcass until it has had its fill. Along the coast caracaras sometimes force brown pelicans to disgorge their food, which they then eat themselves. Snakes, lizards, frogs, turtles, small mammals, insects, and fish are important, depending upon availability. Birds are seldom caught, and the charge that this species bothers domestic animals seems groundless and is probably based on seeing them eat animals that have died from other causes.

VOICE: Early and late in the day it utters the strange, harsh cackling call from which its name is derived.

NEST: (I. 28, A.) In some areas the nest site is the head of a palm, yucca, or cactus; in others, the crown of a tall tree or, rarely, a cliff ledge, at heights varying from 8 to 80 feet. The bulky, deeply cupped nest to which material is added year after year is made of locally abundant material such as palm-fruit stalks, small bushes, briars, or weed stalks. The 2 eggs (2.3 x 1.8) are white with a brownish wash and heavy brown markings.

RANGE: (R.) Occurs from c. Florida and Cuba, c. Texas, s.w. Arizona, and n. Lower California south to the Guianas and Peru.

Gyr Falcon*

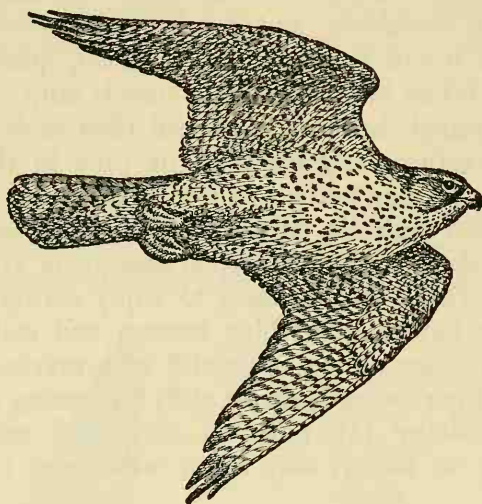
Falco rusticolus—~~40~~
L. 22; W. 48; Wt. 4 lbs.

IDENTIFICATION: These falcons are heavily built with a long tail tapering to a point and broad-based wings more triangular than a peregrine's. In flight they have a slow, powerful, short wingbeat, often interrupted by a short glide. Gyrs generally alight on a rise in open ground, but they also use tall poles. They commonly fly close to the ground, stopping suddenly to hover for a few seconds if something of interest is sighted. In both light and dark plumages they are rather uniformly colored above and below. In the gray phase there is more variation, but they lack the heavy mustache marks of the peregrine. Young are streaked instead of barred and spotted below and generally have more uniformly dark under parts.

HABITS: These falcons vary from virtually white to solid black; almost every color between the two extremes may be encountered. In n. Greenland the white phase seems dominant, but across the American Arctic a dark phase predominates, although a great many intermediates occur. The gyr is a versatile bird of prey, quite willing to subsist almost wholly on the small mouselike lemming or the large arctic hare if abundant, but when these animals become scarce, as they do periodically, it shifts to a bird diet, chiefly ptarmigan. When these prolific northern grouse gather into flocks and move to their wintering grounds gyrfalcons commonly follow them and winter in the same area. The teeming sea-bird colonies of the Arctic are another important source of food, the falcons often nesting near them and living on murrelets, dovekies,

and kittiwakes. Shore birds and ducks are taken in summer, and when the gyrs wander down to our coasts in winter they are usually seen near the great gull concentrations.

VOICE: A staccato series of high-pitched notes producing a shrill chatter or rattling scream.



NEST: (I. 29, A.) These birds nest on almost any kind of rock ledge, the same site being used year after year. The nest consists of a few sticks, some moss and grass, but there is often an enormous accumulation of excrement and food waste. The 4 eggs (2.3 x 1.8) are white washed with reddish-brown and heavily spotted with browns.

RANGE: (P. M.) Breeds around the world in the open, treeless tundra of the Arctic south to the northern limit of tree growth. Some migrate south in winter, a few occasionally reaching Long Island, New York, e. Pennsylvania, Ohio, Minnesota, Montana, and Washington. Abroad they reach Great Britain, the Baltic, and c. Russia.

Prairie Falcon*

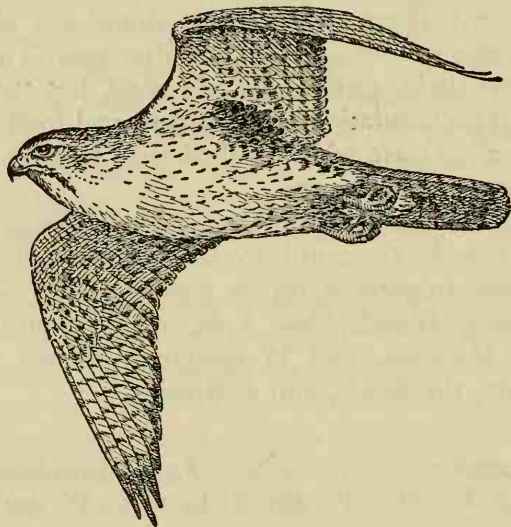
Falco mexicanus—~~4~~41

♂ L. 17½; W. 40; ♀ L. 19½; W. 42; Wt. 2 lbs.

IDENTIFICATION: The pale clay-colored upper parts and, in flight, the black areas where the wings join the pale underbody are distinctive. Young are more heavily marked below and have lead-colored feet and legs.

HABITS: (Age 9 yrs.) This splendid falcon is typically a bird of the dry, open country of our West. Although generally confined to lower elevations and foothills, nesting in badlands,

canyons, and other rough areas, it ranges widely over adjacent grasslands and wanders into the high mountains and well-wooded country, where it is known to have occasionally nested. The bird is lighter and more agile than the peregrine and can outfly it at high altitudes; it uses short, powerful wing strokes, and there is little that it cannot overtake. Sparrows, horned larks, blackbirds, and meadowlarks provide much of its food, but it can handle magpies, doves, quail, partridge, and grouse. When hunting it often travels only 20 or 30 feet above the ground, hovering now and then to look for prey. Usually it captures and binds to its prey in the air, then carries it to a feeding perch in a tree or on a post. Such mammals as ground squirrels, pocket gophers, mice, young rabbits, and prairie dogs and, at times, grasshoppers are important in the diet. These falcons seem to enjoy diving at and annoying large hawks, great blue herons, and owls, but they often live in peace on the same cliff with ravens. Limited in numbers by their dependence on cliffs for nesting and by their territorial jealousy (16 miles of ideal cliff was found to support only 23 pairs), they are a rather rare bird in most areas.



VOICE: Sometimes a rapid series of high-pitched rather musical whistled notes; at others, a harsh series of cackles.

NEST: (I. 32, A., N. 35) The typical site is a ledge protected by an overhang, or a shallow cave or pothole near the top of a cliff. The birds build no nest but occasionally scrape out a niche in a dirt bank or use the nests of such cliff-nesting

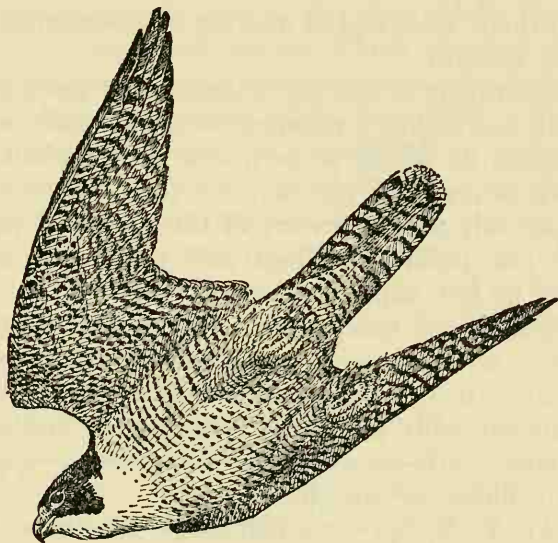
birds as ravens, red-tailed hawks, and golden eagles. The 5 eggs (2.1 x 1.6) are white with small dots and larger spots of brown.

RANGE: (P. M.) Breeds from North Dakota, s. Alberta, and s. British Columbia south to Lower California and s. Mexico and east to w. Nebraska and w. Texas. Some birds winter throughout the breeding area, but there is definite migration and a few wander as far east as Minnesota and Illinois.

Peregrine Falcon*
(Duck Hawk)

Falco peregrinus—#41
♂ L. 17; W. 40; ♀ L. 19; W. 45

IDENTIFICATION: In flight the long, pointed wings and compressed tail mark this as a falcon. Its size, bold head pattern, and fast, powerful flight distinguish the species.



HABITS: (Age 15 yrs.) The breeding distribution of these cliff dwellers is largely controlled by the availability of suitable nest sites. They favor seacoast areas, and while they occur throughout the Far West they are far less numerous than the prairie falcon in the more arid regions and higher altitudes. Many migrate south along the outer beaches, flying long distances over the water and often perching on the masts of coastwise vessels. Sometimes they stay with a boat for a day or two, feeding on petrels, terns, and small gulls. Incredibly swift and agile, these falcons seem able to take any prey they wish with the greatest ease. Frequently they indulge in

spectacular aerial evolutions in what seems to be a spirit of play, harrying flocks of small birds, badgering other hawks, or forcing herons and other large birds to earth without any apparent attempt to do more than scare them. When not in a hurry they fly with a few short strokes followed by a glide and at times soar up out of sight on a mountain updraft.

Most of their prey is killed in the air. Sometimes the victim is sent spinning to the ground by a terrific blow from the big, powerful feet, delivered at the end of a dive from above, and is retrieved later. At other times the prey is simply plucked out of the air. In wooded regions high-flying birds like jays, flickers, robins, nighthawks, and many of the black-birds are the most frequent casualties. In open country many sparrows and meadowlarks are taken, and in some regions, especially in the Far North, small mammals are eaten. Plovers and sandpipers are the chief food of the peregrine in many northern areas and of migrant and wintering peregrines along the seacoast.

The skyscrapers of our big modern cities provide the peregrine with everything it requires—artificial cliffs on which to perch, ledges on which to nest, and an abundant supply of feral rock doves (city pigeons) for food. These falcons are almost the only natural enemy of the hordes of pigeons that frequent our public buildings and parks and are usually welcomed by city authorities.

VOICE: Seldom heard except about the aerie in protest against intruders, a series of harsh, cackling notes, those of the "tercel" (male) being higher-pitched than the falcon's. The conversational calls are shrill, whining, or wailing sounds. A common call—*wееее-chew*, *wееее-chew*—suggests the notes of a flicker or grackle.

NEST: (I. 34, A., N. 34) On a cliff ledge, usually well sheltered by an overhang, and near the top, where it commands a wide view of the surrounding country. Occasionally the aerie is hidden below the level of the tops of the trees growing at the base of the cliff, or it may be in a comparatively low rock wall. In some areas a cavity in the broken top of a giant tree or an old tree nest of a large bird is used. Little or no nest is built, the eggs being laid in a "scrape" in whatever dirt and debris are already on the ledge. The 3 or 4 eggs (2.0 x 1.6) are creamy-white, heavily marked with rich reddish-browns.

RANGE: (P. M.) Widely distributed as a breeder on every continent and in many island areas. In North America it breeds

from Greenland, the Arctic Islands, and n. Alaska south to n. Georgia, n. Louisiana, c.w. Texas, and c. Lower California. Winters from Massachusetts, Indiana, Colorado, and s. British Columbia south through the West Indies and Mexico to n. South America.

Aplomato Falcon**Falco femoralis*—~~41~~

(Orange-chested Hobby) ♂ L. 15; W. 35; ♀ L. 17½; W. 40

IDENTIFICATION: The striking head markings and black lower breast and flanks are distinctive. Young birds are similar in pattern but brownish, with solid black instead of barred wing linings.

HABITS: This widely distributed South American falcon reaches the extreme northern limit of its range in our Southwest, where it has become increasingly rare within recent years. Insects are apparently one of its chief foods, but it takes small birds, snakes, and lizards. Much of its time is spent searching for prey from a vantage point, which may be the top of a tall tree or a desert shrub. From here it makes quick dashes after flying insects or animals whose motion has attracted its attention, returning to the perch to eat the captive. These falcons are quickly drawn to a grass fire, over which they hover to catch the grasshoppers and other insects and small animals driven out by the flames. There are reports that they fly along over trains to catch the birds flushed into the open by the locomotive.

VOICE: Said to be a loud scream.

NEST: (A.) In our Southwest, a platform of sticks with a grass lining, placed 7 to 15 feet up in the top of a yucca, mesquite, or other low tree in dry, open country. Often it is simply the old nest of some bird like the white-necked raven. The 3 eggs (1.8 x 1.4) are white, well marked with pale or russet browns.

RANGE: (P. M.) Breeds from s. Texas, s. New Mexico, and s. Arizona south through most of South America to Tierra del Fuego. Withdraws southward from its United States range in winter.

Pigeon Hawk*Falco columbarius*—~~41~~

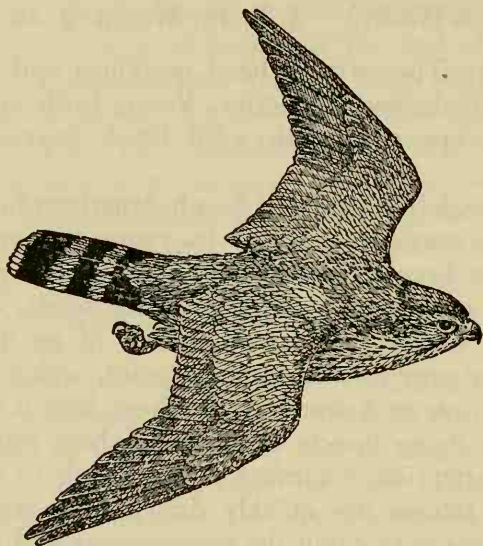
(Merlin)

♂ L. 10; W. 25; Wt. 6 oz.;

♀ L. 13; W. 26; Wt. 8 oz.

IDENTIFICATION: This stocky little bird, which has the typical pointed wings and rowing flight of a falcon, resembles a

pigeon in the air; hence its name. The white-tipped, barred tail and the heavy dark streaking below are good field marks. Regional color variation is pronounced. Northern Great Plains males are pearl gray above while humid coastal British Columbia specimens are almost black, the brown-backed females and young showing comparable variations.



HABITS: Woodland openings and borders of lakes, ponds, and marshes are favorite hunting grounds of the merlin when it nests in wooded areas. Many nest in open, shrubby barrens, bogs, or parklike grasslands with scattered trees. Much of their time is spent on lookout perches on a dead snag or rock, from which they make swift forays after such prey as may be sighted. At times they hunt on the wing, soaring or hovering, and occasionally consume their prey in the air. The merlin often shows great curiosity about man and little fear of him. It is a great badgerer of larger birds like gulls, crows, and kingfishers. Migrations usually coincide with heavy movements of the small birds on which it feeds. Pigeon hawks seldom appear in numbers except along the marshes and beaches of the seacoasts or large lakes. Small birds and big insects are staple foods. Warblers, sparrows, and thrushes are most often taken, but chimney swifts and swallows are caught and occasionally birds as large as meadowlarks, flickers, or black-bellied plovers. Dragonflies are a favorite food (one pigeon hawk had eaten 34), and many butterflies, grasshoppers, katydids, and cicadas are taken.

VOICE: A rapid series of harsh, cackling notes, seldom heard except at the nest.

NEST: (I. 30, A.) The merlin is not much of a nest builder but is extremely adaptable in the matter of sites, using old crow, magpie, and other nests in deciduous or coniferous trees. A hollow in the ground on a small dune, hill, or other rise will do. Cliff ledges, holes in cut banks, cavities high in tree trunks, including old woodpecker holes, are occasionally used. The 4 or 5 creamy-white eggs (1.6 x 1.2) are washed with reddish-brown and finely or boldly spotted with browns.

RANGE: (P. M.) Breeds throughout the boreal spruce-fir forests of the whole Northern Hemisphere north to the limit of trees. In North America from n. Labrador, n. Manitoba, n.w. Mackenzie, and n.w. Alaska south to Nova Scotia, s. Quebec, n. Michigan, Wyoming, and s. Oregon. Winters from n. Florida and the Gulf Coast, Colorado, and s. British Columbia south through the West Indies and Central America to n. South America. An occasional bird may be encountered almost anywhere in the United States in winter, and it regularly reaches Bermuda.

Sparrow Hawk (American Kestrel)

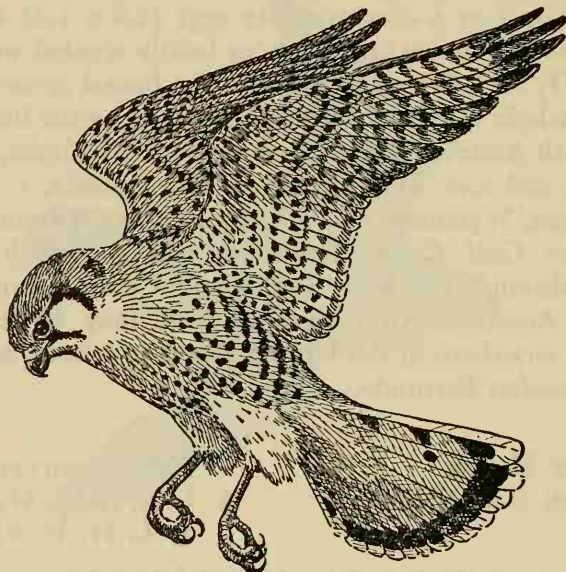
Falco sparverius—~~41~~
♂ L. 9½; W. 21; Wt. 3 oz;
♀ L. 11; W. 24; Wt. 4 oz.

IDENTIFICATION: This little red-tailed falcon has a very distinctive color pattern, and its slender, pointed wings give it a crescentlike silhouette. It hovers a great deal as it hunts. Young are very similar to adults.

HABITS: Like all birds of prey, this falcon has remarkable eyesight and commonly spends much of its time searching for prey from a lookout perch on top of a tall object. It frequents open lands and has therefore greatly increased in the East as forests have been replaced by pastures and croplands with scattered trees. Farther west in the once treeless grasslands this species has benefited from the planting of trees and the setting up of public utility poles, poles and wires being among their favorite perching places. An abundant and easily caught supply of English sparrows, plenty of lookouts, and many convenient crevices for nests make cities good sparrow hawk habitats, and in recent years it has become a common city resident.

This species lives almost exclusively on insects when they are available in quantity. Grasshoppers are of major impor-

tance, followed by crickets, large beetles, caterpillars, dragonflies, spiders, and even ants. Meadow and white-footed mice and other small mammals and small birds, chiefly sparrows, are common foods at other seasons. Many lizards and small snakes are eaten. Remarkable concentrations of these falcons often occur in areas suffering from a plague of grasshoppers, locusts, or Mormon crickets.



VOICE: A series of 6 or 8 clear, high-pitched staccato notes, *kee-kee-kee*, etc., with a rising inflection.

NEST: (I. 29, A.) In a natural cavity or woodpecker hole in a tree or cactus in or near open land, in holes in cliff walls, burrows in banks, and rarely in the open nest of other birds. It uses man-made sites, such as apartment-house gutters and rainspouts, and will occupy an 8-x-8-inch bird box about a foot deep with a 3-inch entrance hole, placed fairly high. The 4 or 5 eggs (1.4 x 1.1) are white with small brown dots.

RANGE: (P. M.) Breeds from Newfoundland, s. Quebec, n. Ontario, s. Keewatin, n.w. Mackenzie, and s.e. Alaska south through the West Indies and South America to Tierra del Fuego. Winters from c. New England, s. Ontario, c. Illinois, Kansas, Utah, and s. British Columbia south.

GALLINACEOUS BIRDS

and ALLIES

Order Galliformes

CURASSOWS and GUANS

Family Cracidae

Chachalaca*

Ortalis vetula—~~46~~
L. 22

IDENTIFICATION: The long, white-tipped tail and orange throat skin are distinctive. Juvenile birds are more extensively cinnamon-buff than adults and have a barred back, wing coverts, and tail tip of this color.

HABITS: In s. Texas this is a bird of dense thickets of small, thorny, drought-resistant trees known as chaparral. A permanent source of fresh water within a mile or so of their territory seems to be necessary if they are to occupy an area permanently. Chachalacas seem most at home well up in this thick growth, although they often feed on the ground. The flight is swift and generally above the treetops. They fly readily and usually come to rest in the top branches of a tree. Berries, tender leaves, and buds seem to be their chief foods. The precocial young are apparently carried to the ground from the nest until they are able to fly and carried up to a tree at night. This is said to be done by the female, who allows them to cling to her legs as she flies. The chachalaca becomes very tame when kept as a pet, and it takes so readily to barnyard life that it could undoubtedly be domesticated. Unfortunately, it is rapidly disappearing from the Rio Grande Valley as the brushland is cleared for fruit and vegetable farms.

VOICE: A loud, resonant, 3-syllable call from which it derives its name, that of the male deeper and more resonant than the female's. It is delivered over and over from a treetop perch in the half-light of early morning or evening and occasionally on cloudy days. After one bird starts all those in the neighborhood join in.

NEST: (I. 22, P.) The small, sturdily built nest is woven out

of twigs and lined with leaves. It is usually out on the limb of a small tree, where it is well hidden by dense foliage. The height varies from a few feet to 25, and a common site is in the border of a tree clump not far from water. The 3 eggs (2.3 x 1.6) are white and rough.

RANGE: (R.) Occurs from extreme s. Texas through e. and s. Mexico to n. Nicaragua and, as an introduced bird, on Sapelo Island, Georgia.

GROUSE

Family Tetraonidae

Spruce Grouse

Canachites canadensis—~~46~~
L. 16

IDENTIFICATION: The strikingly white-spotted and jet-black under parts of the male are distinctive, as is the fine black barring of the neck and upper back of the female. Young are like females when in juvenile plumage but molt into virtually adult plumage in August and September. Females from southern areas are much browner than those from farther north.

HABITS: This grouse does not display any fear of man and is quite aptly termed "fool hen." Although generally not good eating, it is soon exterminated even in sparsely settled areas by thoughtless persons who kill the birds just for fun. Normally the spruce grouse is common in the whole northern spruce, fir, cedar, larch, and pine forest community from the southern edge of the tundra south. Generally it survives the inroads of civilization longest in the vicinity of lowland swamps and bogs. It is a solitary species, and the small flocks encountered are usually a family group. Each male has its own display ground in a forest opening, where it endlessly repeats a circuit from the ground to a series of tree perches and back, during which it noisily whirs its wings, struts, and inflates the red tissue over its eyes. Staple foods of these markedly arboreal grouse are the needles and buds of the various conifers among which they live and, in summer, berries, seeds, mushrooms, tender leaves of herbaceous plants, and insects, of which the young seem especially fond. A plentiful supply of coarse gravel is important, and the major excursions of these sedentary birds seem to be trips to stream or lakeside sources of this material.

VOICE: Clucking sounds when disturbed and a low rolling note are the only vocal accomplishments. The male makes a loud whirring noise with its wings as part of a regular display performance which is indulged in to some extent throughout the year.

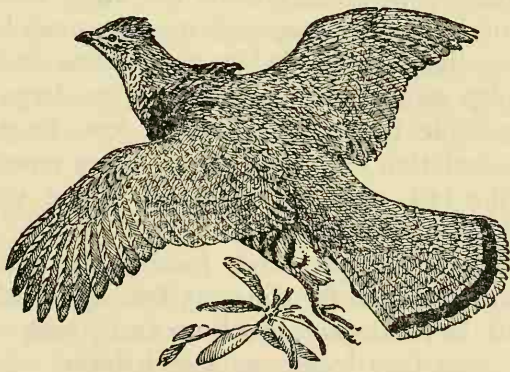
NEST: (I. 17, P.) On the ground in a hollow in moss, lined with grass and leaves and sheltered by a spruce branch or fallen trunk. The 11 or so buffy eggs (1.7 x 1.25) are spotted and blotched with rich browns.

RANGE: (R.) Occurs from n. Quebec, n. Manitoba, n. Mackenzie, and c. Alaska south to n. New England, n. Michigan, s. Saskatchewan, and n. Washington.

Ruffed Grouse*

Bonasa umbellus—~~46~~
L. 18

IDENTIFICATION: A large bird that roars away from almost underfoot, showing a finely barred fan-shaped tail with a black terminal band, is a ruffed grouse. The general color of the upper parts and especially the tail may be reddish-brown or gray as the bird has two distinct color phases. These bear no relation to age or sex, but the proportion of each varies regionally—gray predominating in the North and West, brown in the South. The dark neck ruffs and tail are longer in the male.



HABITS: (Age 6 yrs.) An extensive area of dense woodland of any type is not good ruffed grouse habitat, and the cutting of timber and the establishment of scattered farms in the once virtually unbroken forest greatly benefited this species. Grouse are not gregarious and at most seasons widely dispersed, so an ideal habitat must be able to supply all the

bird's seasonal needs within an area of about 25 acres. These needs are conifers for winter roosting cover, a not too dense hardwood stand for nesting and food, brushy land for escape cover and as a source of berries, and sunny openings for dust baths and insect food for the young. Abandoned farms and orchards that are going back to forest provide nearly ideal grouse habitats until the plant succession finally reaches a stage where the invading trees have killed out the shrubs and closed all the openings.

Until the ruffed grouse of an area have had some years of experience with man they display the same lack of fear as the spruce grouse, but, unlike the latter, they have been able to adapt themselves to hunting and are now one of our sportiest game birds—springing into the air from almost underfoot and roaring off on an erratic course through the woods. Each male has a definite territory with one or more sheltered logs, mounds, or rocks on which it stands when “drumming” the air with quick beats of its wings. In spring females are attracted to the males' territory, but there is no pairing since, like many grouse, this species is promiscuous. The male drums sporadically all year and may do so quite actively for a few weeks in the fall.

Grouse populations are subject to wide fluctuations in any given area. The reason is not known and the fluctuations are not as regular as the well-marked cycles in rodent populations. Under wise management the birds are hunted only during periods of abundance, when seasons can be fairly long and the bag limit liberal. When the decline occurs survivors are carefully safeguarded to preserve as large a breeding stock as possible through the critical low. In good habitats a spring population of 1 bird per 10 acres represents a near peak; in the fall, after the dispersal of the young, it may reach 1 bird per 3 or 4 acres.

Young grouse are precocial, leaving the nest as soon as they dry off; they can fly about 25 feet by the time they are 12 days old. In fall broods break up and young wander, often for miles, until they locate suitable habitats where no other grouse are in residence to drive them away. It is during this dispersal flight that young birds occasionally fly through windows or strike buildings and are said to go crazy. In winter this grouse grows comblike snowshoes on its toes and seeks dense evergreen cover for night roosting. Here territoriality breaks down sufficiently for it to share its roost with several others of its kind. During periods of bitter cold and

high winds grouse leave the tree roost and bury themselves in the snow for the night or for the duration of the storm.

Ruffed grouse start life on an insect diet but soon add fruit, seeds, and leaves and, as fall comes, buds. Buds of yellow, black, and paper birch, aspens, apple, cherry, and blueberry are staples for fall and winter, supplemented by fruits of dogwood, hawthorn, grape, and greenbrier, acorns, beechnuts, and leaves of sheep sorrel, wintergreen, and laurel. In spring and summer the main food of adults consists of a variety of seasonal fruits and the leaves of plants like sedges, strawberries, blackberries, and jewelweed, plus a few insects.

VOICE: Notes vary from a short *quit-quit* of alarm to a loud squeal or whine uttered by the female when she is surprised with young. At a distance the male's famous drumming gives more the effect of a pulsation or throb in the air than a distinct sound. When one is closer it is heard to start slowly with widely spaced beats that increase in frequency until they become a muffled roar that fades out as it ends.

NEST: (I. 24, P.) A hollow in the ground, lined with leaves and placed at the base of a tree, stump, or rock and concealed by low shrubs or branches or occasionally hidden under a fallen log. A common site is near the edge of a patch of a predominantly deciduous, medium-age, second-growth woodland not far from a road, clearing, slashing, or swamp. The 11 or so eggs (1.5 x 1.2) are creamy- to pinkish-buff, sometimes finely spotted with dull brown.

RANGE: (R.) Occurs from s. Quebec, n. Ontario, s. Mackenzie, and c. Alaska south to Virginia (in mts. to Georgia), Tennessee, s. Missouri, n. Colorado, and n. California.

Willow Ptarmigan (Willow Grouse)

Lagopus lagopus—#47
L. 15; Wt. 1 lb. 2 oz.

IDENTIFICATION: This species is larger and has a heavier bill than the other black-tailed ptarmigan—the rock. In the yellow-tinged white winter plumage the face is clear white and sexes look alike. In spring the male has a distinctly reddish neck and breast while the yellow-brown barred female is virtually indistinguishable from a rock ptarmigan. In autumn females become more reddish and the sexes are again similar.

HABITS: Low, open tundra near the coast, grassy arctic prairies, marshy flats, willow-grown river bottoms, and hillsides grown

up to dwarf willows are the usual summer habitats. In more southern areas the birds occur at higher elevations wherever patches of stunted spruce and dwarf willow are found in sheltered spots. Pairs are formed after a vigorous courtship period, and the male defends the nest and the female and her brood by flying at intruders. These abundant and prolific birds are a staple food for Eskimos, and the eggs, young, and adults are at times the chief food of many arctic predators such as gulls, jaegers, various hawks and owls, foxes and other mammals.

In fall the birds move out of areas where snow buries their food too deeply, into river-bottom thickets or wind-swept coastal areas where willow, alder, and birch twigs and buds are available. The shift may be only a few miles or it may involve a long flight and many thousands of birds. In summer the diet is varied with tender leaves, berries, grass and sedges, seeds and leaves, and some insects and spiders—the two last being the principal food of very young chicks.

VOICE: An intruder is scolded with a sharp rattling call, said to sound like a nail run over a comb. Courting males utter a peculiar cackling gobble as they settle to earth on quivering wings after a jump into the air. Various other clucking and cackling notes are also heard.

NEST: (I. 22, P.) On the ground in the open, usually in tundra but also on marsh borders, beaches, and river bars. A hollow in the lee of a rock, grass clump, moss hummock, or dwarf willow is lined with grass and leaves. The 7 or 8 eggs (1.7 x 1.2) are pale yellowish, heavily and boldly marked with blackish-brown.

RANGE: (P. M.) Occurs throughout the Arctic Zone of both hemispheres south in Europe to about Lat. 60°, and to Lat. 45° in Asia. In North America breeds from the Arctic Ocean and Greenland south to Newfoundland, c. Quebec, n. Ontario, n. Manitoba, and c. British Columbia. In winter migrates south as far as s. Quebec, c. Ontario, and s. Alberta.

Rock Ptarmigan

Lagopus mutus—~~47~~
L. 13

IDENTIFICATION: Males and some females have a black streak from the bill through the eye when in the pink-tinged white winter plumage, which, in parts of the Far North, the adult males wear well into midsummer. The summer plumage is coarsely barred with blackish and buff—darker in males,

yellower in females. A finely vermiculated, pepper-and-salt fall body plumage follows in which males are quite gray, females somewhat browner. The flight feathers are always white and the tail, which is concealed except in flight, is black except in juveniles.

HABITS: The barest, rockiest arctic uplands and barrens are the usual summer home of the rock ptarmigan. One of the hardiest of all birds, it ranges south only to exposed mountaintops. In winter some remain on the breeding grounds to feed in wind-swept areas or dig through the snow with their heavily feathered, sharp-clawed, rabbitlike feet. Others move to lower altitudes but never seek real shelter like the willow ptarmigan. Birds of the extreme North gather into flocks and move south out of the region of continuous darkness, often crossing wide bodies of water. They are usually accompanied by gyrfalcons, for whom they are a staple winter food. Eskimos also eat them, luring them into traps by darkening an area to make it look free of snow. The flight of this species is fast but rolling and close to the ground, the birds rising and falling with the contour of the land. Twigs, buds, berries, tender leaves, moss, insects, and spiders are normal foods.

VOICE: A rolling, snorelike, 2-part call and a loud series of pheasantlike cackling notes are given by disturbed birds. At other times clucking, purring, growl-like, and whining notes are heard.

NEST: A hollow in the open ground of the tundra, sheltered only by a rock or hummock and lined with grass, moss, and feathers. The 6 or 7 eggs (1.7 x 1.2) are pale buff, spotted with dark blackish-brown.

RANGE: (P. M.) This circumpolar species ranges from the Arctic Ocean and its islands south in Eurasia, to the mountains of Scotland, n. Spain, c. Austria, s. Siberia, and n. Japan. In North America they breed south to Newfoundland, Ungava, s. Keewatin, c. Mackenzie, and n. British Columbia. There is some withdrawal in winter from the most northern parts of the range.

Prairie Chicken (Pinnated Grouse)

Tympanuchus cupido—#46
L. 17¼; W. 28; Wt. 2 lbs.

IDENTIFICATION: The strongly barred appearance, especially of the under parts, is distinctive, as is the short, rounded tail when the bird is in flight. The blackish neck tufts are conspicuous in the male but much shorter in the female. The

female has a barred instead of solid tail and has no air sacs on the neck.

HABITS: The range and abundance of this grouse have undergone many changes since colonial days. When the first settlers arrived they found it abundant where fire or sandy, rocky soil had prevented normal forest growth. In open pine or oak barrens and blueberry heaths the birds fed on acorns, buds, tender leaves, insects, and wild fruits and were called "heath hens." Easy to shoot, they gradually succumbed to overhunting and disappeared from one part after another of their eastern range. In the West they were originally limited to the eastern part of the natural grasslands or prairies and were not notably abundant until agriculture began to provide large quantities of very acceptable foods. Then they increased tremendously and with the gradual spread of grain raising moved north and west through the Great Plains up into the Prairie Provinces of Canada, gaining in the West, at least temporarily, more range than they lost when they vanished from the East.

Although it was once heavily hunted for the market and is often shot illegally today, the prairie chicken's disappearance from most regions is usually a result of the plowing of too high a proportion of the native grassland, a process which is currently wiping out the Attwater's race that once occupied the coastal prairies of Louisiana and Texas. In these areas utilization of land for rice planting and other intensive forms of agriculture is now approaching 100 per cent. Recent studies show that the birds cannot maintain themselves unless at least 20 to 40 per cent of the land is in permanent wild or cultivated grass which is not overgrazed, mowed too late, or burned—a minimum vegetation height of 6 inches being necessary for roosting cover in winter and nesting in spring. Worn-out croplands, now returning to grass, may help restore some of the lost habitats. Thus, like the ruffed grouse of the abandoned New England farms, this species stands to benefit from our destructive land-use practices.

The prairie chicken has communal courtship grounds where up to 30 or 40 males gather at sunrise and sundown to display, boom, fight, and mate with any females they attract. The grounds are used from January to June and sometimes from September to November. No pairs are formed, and 1 or 2 dominant males do most, if not all, of the mating. After the females have reared the young the birds gather into flocks, each flock all of one sex. At times

there is a southward movement, but it seems to involve only flocks of females. Food in summer includes insects, chiefly grasshoppers and locusts, but the staple diet is tender leaves of clover, lespedeza, etc., and seeds of grasses, sedges, and weeds. Later such fruits as coral berry and rose hips are eaten, but as soon as available and as long as it lasts, waste corn, oats, wheat, rye, and sorghum are the birds' chief foods. Heavy snows in late winter send the birds to sumacs and elms, but these supply only emergency foods.

VOICE: A variety of chickenlike cackles and cluckings. In spring, males, with the aid of inflatable air sacs, make a drawn-out hollow cooing sound which carries for a mile or more. It can be approximated by blowing across the top of an empty beer bottle.

NEST: (I. 23, P.) In a slight hollow in the ground, lined with a few grass and weed stems. The site is usually in the open or among brush and scrub trees. The nest is extraordinarily hard to find as it is generally well concealed in a dense stand of last year's grass or weed stalks. The 11 or so eggs (1.8 x 1.3) are olive with fine dots and a few larger pale brown spots.

RANGE: (P. M.) Has occurred at one time or another from s. Maine, s. Ontario, s. Michigan, s. Manitoba, and w.c. Alberta, south to Virginia, Kentucky, s. Louisiana, and coastal Texas, and west to e. Wyoming and n.w. Texas. Now not found east of Indiana.

Sharp-tailed Grouse* *Pedioecetes phasianellus*—~~46~~
L. 19; W. 27; Wt. 2 lbs.

IDENTIFICATION: The pale color and dark V-shaped breast markings are distinctive. In flight the wings are noticeably spotted with white and the 2 elongated brownish feathers in the center of the white tail are conspicuous. Juvenile birds are finely penciled with white above and lack the white tail. In winter the species is buffier and more rufous than in summer.

HABITS: The sharp-tail is essentially a brushland grouse and is found on the prairie only in summer and in the vicinity of timber. With the coming of agriculture to the prairies and the increase of the prairie chicken that followed in its wake, the sharp-tail has largely abandoned this habitat in the southern part of its range. It has, however, greatly benefited at the expense of the spruce grouse from the cutting and

burning of the northern spruce forest, which has created vast areas of brushland and deciduous second growth well suited to its needs. The sharp-tail is so tame and easy to shoot that despite its high reproductive rate it is not able to maintain itself near civilization, even in good habitats, except under careful management. In spring local males gather in an open area to fight and go through their courtship performance, which is marked by a rapid stamping of the feet, a rustling of the feathers, and cooing noises made with the aid of inflatable purplish air sacs on the sides of the neck.

When grasshoppers and locusts are available, sharp-tails eat large numbers of them and the young feed almost wholly on insects. In the main, the species is herbaceous, feeding on tender leaves, buds, and especially on flowers of both herbaceous and woody plants. Waste wheat and weed seeds are taken and, in the fall, acorns and such wild fruit as hawthorn and rose hips, cornus, coral berry, and juniper berries. In the winter the birds are more or less arboreal and feed in treetops on the twigs and buds of bog and paper birch, willow, poplar, alder, larch, and juniper. However, like prairie chickens, they roost at night on the ground under the snow.

VOICE: Chickenlike cacklings and a gobbling note. During courtship males utter pairs of short, deep *coos* not unlike a mourning dove's.

NEST: (I. 21, P.) On open prairie in a scantily lined hollow in the ground under a thick tuft of bunch grass; in a brushy area often near water and well hidden under a bush or thick weeds; or on a dry knoll in a swamp. The 12 or so eggs (1.7 x 1.3) are brownish-olive, usually finely dotted with dark brown.

RANGE: (P. M.) Occurs from n. Quebec, n. Manitoba, n.w. Mackenzie, and c. Alaska south to n.e. Illinois, c. Kansas, n. New Mexico, s. Utah, and n. California.

PHEASANTS, PARTRIDGES, and QUAILS

Family Phasianidae

Partridge*
(Hungarian Partridge)

Perdix perdix—~~47~~
L. 12½; Wt. 13 oz.

IDENTIFICATION: The barred flanks, gray breast, and the chestnut patch on the lower breast are distinctive. In flight the

short dark chestnut-brown tail is prominent. Juveniles are buffy-brown, paler below and white on throat and belly, and have a terminal tail band.

HABITS: In the vast grain-raising area of the n. Great Plains land tends to become so intensively cultivated that no native gallinaceous bird can survive, yet it provides an ecological niche for a bird that can utilize waste grain (2 to 5 bushels to the acre), weed seeds, green foods, and insects, and can nest and winter in the scant, largely herbaceous cover that exists in and around the fields. Furthermore, the bird must be so alert and wary that hunters can take only a fraction of its fall population. The Hun has proved to be such a bird, and from a few small releases some 40 years ago it has so increased and spread that it is now abundant over much of the Northwest. In only 2 other areas, in the northern corn belt, has it shown a similar ability to survive, and the money spent to liberate some 300,000 birds in various other parts of the United States has been wasted. Either the climate or habitat was unsuitable or the area was already occupied by a species with which these partridges were unable to compete.

Even where it is established, the Hun often holds its ground only because of its exceedingly high reproductive rate. It suffers heavy nest mortality from spring plowing, the burning of stubble, and from the early mowing of hay and alfalfa and the harvesting of early grains. Predators take a serious toll of those that nest in narrow fence rows where the nests are easily found, and on wet clayey croplands the young often get such balls of mud on their feet that they perish. Heavy snows are hard on the birds unless there is standing corn, as they cannot dig down through more than a few inches of snow to the green food they need to tide them over such emergencies.

VOICE: When flushed, a rapid cackle that slows down as the bird flies away. The male's crow, most commonly heard at dusk, is a hoarse, guinealike *kee-ah*. Both sexes use a similar sound as a rally call.

NEST: (I. 23, P.) The preferred site for early nests is in undisturbed wild grass in wasteland and along roadsides, fence rows, or ditchbanks, but later in the spring many are in hay-, alfalfa, or grainfields. A scrape in the ground is lined first with coarse stems and then with fine, soft grass. The 16 eggs (1.4 x 1.0) are uniform olive color.

RANGE: (R.) Native to Eurasia from c. Sweden and n. Russia

south to n. Spain, Greece, and n. Persia and east to c. Siberia. Established in s. Michigan, s. Wisconsin, n.w. Ohio, n. Indiana, and n.e. Illinois; also from Montana and British Columbia south to Iowa, s. Montana, and Oregon.

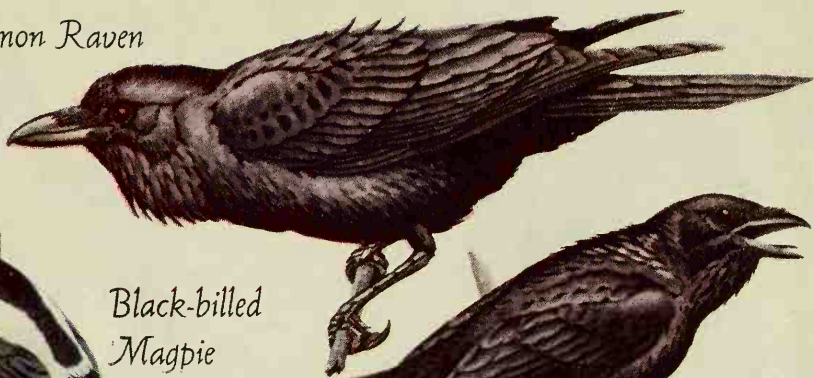
Bobwhite
(Common Quail)

Colinus virginianus—~~47~~
L. 10; Wt. 7 oz.

IDENTIFICATION: This is a small, chunky, reddish-brown bird with a distinctive head pattern and a dark, grayish tail. Head markings are black and white only on the adult male.

HABITS: The bobwhite is usually most abundant about cultivated land, fallow fields, or recently abandoned farmland grown up to weeds and briar patches, but it also occurs in open pinelands, brushy pastures, prairies, and semi-arid grasslands with scattered mesquite, cactus, or other thorny cover. Dense woodlands and areas devoid of occasional patches of dense brush are avoided. Thus the clearing of forested areas and the planting of roadside and fence-row hedges across the prairies have greatly expanded its habitat. In the South the late-winter burning of open pine woodlands stimulates the growth of the wild legumes that are one of its chief foods in this region and produces heavy populations even in the absence of agriculture. The cultivation of corn made possible a northward spread into the region of heavy winter snows where corn shocks or standing stalks with a few unharvested ears provide an always accessible food supply. Here, however, the bird's foothold has remained precarious, occasional hard winters almost wiping them out, and in this region they can seldom stand a very heavy hunting toll. Survival of the fittest through many generations has produced a hardy, heavy, well-feathered strain in these northern areas, but it seems now to have been destroyed in many sections through hybridization with southern birds that were shipped in and liberated in misguided attempts to bolster the overshot local population. In fact, artificial stocking of this prolific bird is seldom justified. If it is not abundant something is wrong with the environment or it has been grossly overshot, in which case all it needs is protection. Usually the trouble is in lack of sufficient well-distributed escape and roosting cover in the form of dense briar thickets and vine tangles, broad, thickly brushed fence rows, and good stands of undisturbed roadside vegetation. Predator-proof cover of this type within 150 feet of a good food supply is an essential winter requirement.

Common Raven
p.84



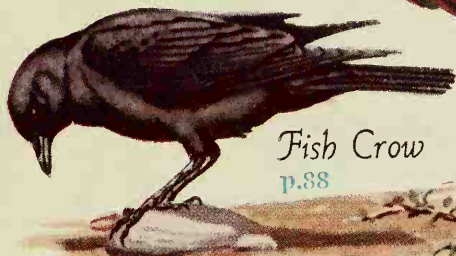
Black-billed
Magpie
p.83



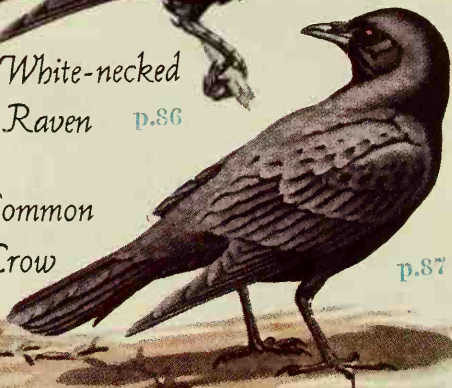
White-necked
Raven
p.86



Fish Crow
p.88



Common
Crow
p.87

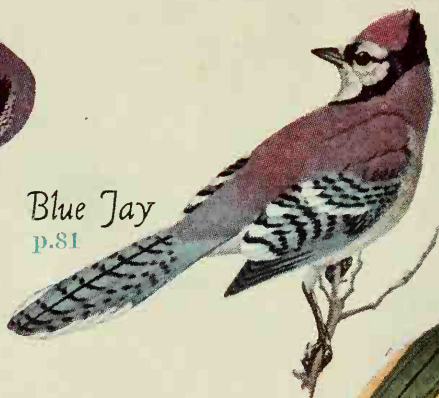


p.81

Scrub Jay



Blue Jay
p.81



JUVENILE



Canada Jay
p.80



ADULT

Green Jay
p.83



Mexican Flycatcher
p.59



Crested
Flycatcher
p.58



Olive-backed
Kingbird
p.54



Olive-sided
Flycatcher
p.67



Western Kingbird
p.55



Gray
Kingbird
p.54

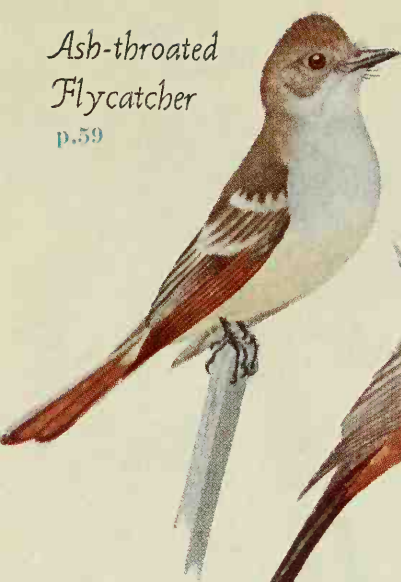


Eastern Kingbird
p.53



*Ash-throated
Flycatcher*

p.59



*Eastern
Phoebe*

p.60



p.61

*Say's
Phoebe*



Eastern Pewee

p.65



*Beardless
Flycatcher*

p.69



Western Pewee

p.66



*Least
Flycatcher*

p.65

*Yellow-bellied
Flycatcher*

p.62



*Acadian
Flycatcher*

p.63

Alder Flycatcher

p.63



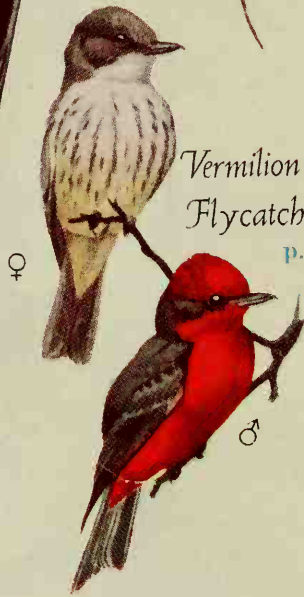
Carolina
Parakeet
p.1



Scissor-tailed
Flycatcher
p.56

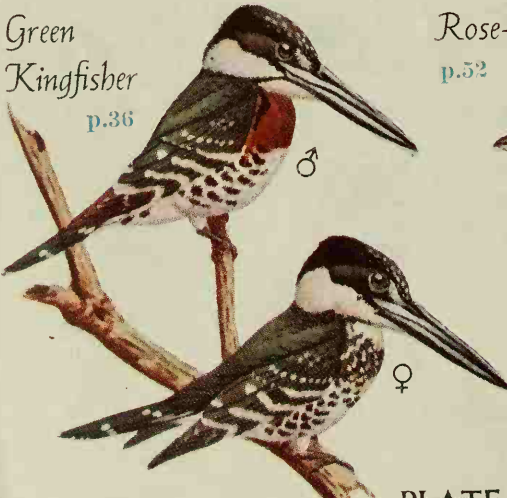


Vermilion
Flycatcher
p.68

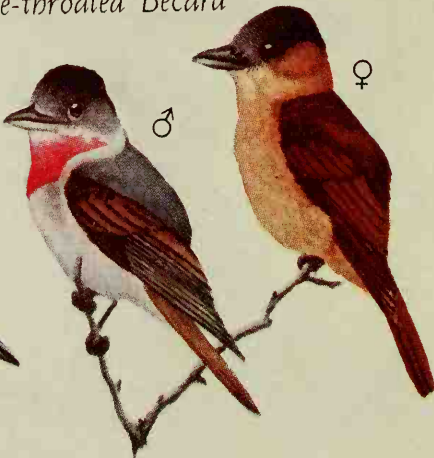


Kiskadee Flycatcher

Green
Kingfisher
p.36



Rose-throated Becard
p.52



Unfortunately, this species has suffered a serious decline in many farming areas owing to the tendency to keep things too clean. Roadside vegetation is cut close or burned; fields are plowed to the fence or made so large that most of the food in the center is too far from cover for quail to use it. Fall plowing of weeds, stubble, or fallow fields and the breaking down of old cornstalks seriously affect food supplies. Often the most adverse factor is the destruction of nesting and brushy cover by heavy grazing. In the West this has eliminated the bobwhite in many areas, while in the South the fire-exclusion program of recent years has greatly reduced their numbers in the long-leaf pine forests by permitting the development of broom-sedge roughs and deciduous brush.

Food is seldom a problem except in winter as quail are omnivorous, eating seeds, insects, fruit, greens, and buds. In summer they pair to rear their young, but at other times they are in coveys of up to 30 birds. Each group makes its headquarters and roosts at night in good cover, ranging out to feed along brushy travel lanes for 300 to 400 yards and scattering in all directions when flushed. No covey allows others to trespass, nor does any covey accept additional members once the quota of 25 to 30 has been reached.

VOICE: The *bobwhite* or *bob bob-white* call of unmated males in the spring and the *a-loie-a-hee* answering call of the female proclaim their presence far and wide. Members of a scattered covey use a human-sounding *quoi-hee* whistle to locate one another. These form only part of the extensive vocabulary.

NEST: (I. 23, P.) Preferred sites are thick clumps of last year's bunch grass, brushy woodland borders, or tangles of vines and shrubs along fence rows, but any dense, grassy cover may be used. The nest is a hollow scooped out by the birds and lined with grass. The eggs are concealed by a well-woven arch of vegetation. The 15 or so eggs (1.2 x .95) are dull white.

RANGE: (R.) Occurs from s.w. Maine, s. Ontario, and s. Minnesota south to Cuba, along the Gulf Coast, and through Mexico to w. Guatemala and west to South Dakota, e. Colorado, s. Arizona, and formerly Jalisco.

Scaled Quail*

Callipepla squamata—~~47~~
L. 11

IDENTIFICATION: The dull gray appearance of this bird, together with the white-tipped crest and "scaled" under parts, is distinctive. Young are quite rufous.

HABITS: This is a bird of the dry, arid Upper Sonoran Zone, often occurring in areas far from water. It seldom flies but runs from one to another of the dense patches of thorny shrubs, yuccas, and cactus plants that dot such landscapes. Scaled quail are most abundant among the weeds and grasses of dry washes and river valleys, as they like to make daily visits to water. Rather trusting by nature, they quickly become tame about the isolated farms and ranches to which they are attracted by the presence of water. Their numbers have always had a tendency to fluctuate widely, as both heavy rains and drought effect them adversely. Recently in many areas they have been reduced by overgrazing, which has destroyed the brushy thickets which are so essential to their habitat. Insects are important foods, but seeds are staple, along with tender buds and other vegetation.

VOICE: A low, nasal whistle, *pay-cos, pay-cos*, and a loud barking *kuck-yur*.

NEST: (I. 21, P.) In a slight hollow, lined with a little grass, under a low bush or in a dense clump of grass in dry country, occasionally in a hay- or grainfield. The 13 or so eggs (1.3 x 1.0) are pale buff, evenly dotted with red-brown.

RANGE: (R.) Occurs from c. Texas, s.w. Kansas, s. Colorado, and c. Arizona south to c. Mexico.

Pheasant

Phasianus colchicus—~~4~~46

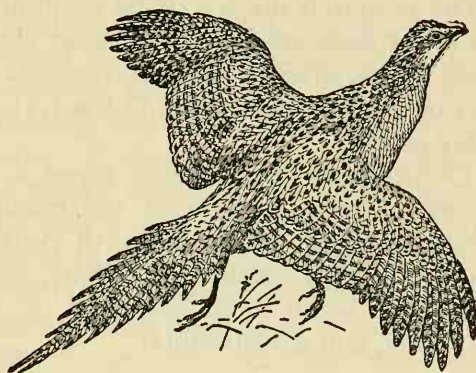
(Ring-necked Pheasant)

♂ L. 35; T. 18; ♀ L. 20½; T. 11½; Wt. 2½-4½ lbs.

IDENTIFICATION: The white ring on the neck of the male is a variable character, but this striking bird is unmistakable. The protectively colored hen can best be distinguished from a grouse by its long, tapering brownish tail.

HABITS: (Age 8 yrs.) The pheasants in North America are hybrids of several races but are generally closest in appearance to the ring-necked pheasant of e. China. In suitable environments the birds have increased rapidly from small initial introductions and, like so many introduced species, have often reached higher initial population levels than they seem able to maintain permanently. Pheasants generally do best where grains are raised and standing corn or soybean stalks can be gleaned for winter food. Good winter cover is important, but they are wide-ranging and gregarious at this season and can seek it out. The dense, matted vegetation of marsh and bog borders is ideal, but dense young oaks or conifers on

recently cutover land and ungrazed wood lots are good. Sometimes unmowed meadows or the weedy growth in fallow fields suffice. Buds and green vegetation such as grass, clover, alfalfa, dandelion, and dock are eaten and in winter serve as emergency food, but seeds are the pheasants' mainstay, especially the seeds of cultivated grain. Fruits such as wild grape, panicled dogwood, wolfberry, Virginia creeper, and Russian olive are often important in the winter diet. Seeds of ragweed, hog peanut, foxtail grasses, skunk cabbage, wild sunflower, knotweed, jewelweed, and smartweeds are among those most extensively utilized. When available, insects are taken, especially larval forms like cutworms, also grasshoppers and beetles. Snails are eaten with relish at times.



In spring the large winter flocks break up, the cocks scattering out to take up individual crowing territories. These are well separated and must include a good patch of brushy cover near herbaceous nesting cover. The cocks mate with one or more females who build their nests nearby. The common habit of nesting in hay-, alfalfa, and grainfields subjects the species to heavy losses when mowing is done before July 10. Not only are eggs and chicks destroyed, but the hens often lose both legs. At first the young live largely on insects picked up in croplands. In fall pheasants return to the hedgerows, which they use as travel lanes, and escape cover while gleaning waste grain and weed seeds from the bare fields.

In good environment cocks can stand heavy hunting pressure since they are polygamous and only 1 is needed for every 5 to 10 females. Pheasants would be far more abundant in many parts of their range if farmers would leave fence-rows, ditchbanks, and roadside growths undisturbed; fence

cattle out of wood lots, waste corners, and gullies; avoid burning; give dense marshy growths especial protection; do their first mowing as late as possible and the last early enough to permit a little further growth; and keep farm cats and dogs at home during the nesting season. The planting of multiflora rose or other thick hedges, scattered windbreaks, or clumps of conifers will help, as will the leaving of a row or two of unharvested corn, grain, or soybeans along the border of the fields.

VOICE: The male has a loud, bantamlike crow—*kok-cack*—followed by a drumming of the wings and, when flushed, utters a very loud, harsh, almost machinelike clatter. The far less noisy hens have shriller notes.

NEST: (I. 24, P.) A slight hollow in the ground, lined with a little grass. The preferred site is a dense stand of hay, alfalfa, or grain, but many nests are hidden in dense clumps of grass or weeds along fences, drainage ditches, roadside or woodland edges. The 11 or so olive-brown eggs (1.6 x 1.3) are laid over about a 14-day period.

RANGE: (R.) Occurs from the Ukraine across c. Asia to n.e. Manchuria and s. China. Introduced and established in the wild over most of Europe and in North America from c. Maine, s. Ontario, c. Wisconsin, s. Manitoba, c. Alberta, and s. British Columbia south to n. Maryland, n. Kentucky, n. Oklahoma, s. Utah, and c. California.

TURKEYS

Family Meleagrididae

Turkey

Meleagris gallopavo—~~46~~

♂ L. 48; W. 60; Wt. 15–20 lbs.; ♀ L. 36; Wt. 9 lbs.

IDENTIFICATION: The turkey was domesticated in s. Mexico, where the local race has white-tipped upper tail coverts and tail feathers. In northern races these feathers are tipped with brown. A wild turkey is a very trim-looking bird—its legs and neck long, head small, and body slender. The body feathers of the hen have a buffy tip instead of a black bar, which makes her much paler than the cock.

HABITS: (Age 12 yrs.) This splendid game bird has disappeared from roughly 70 per cent of its original range in the United States. Although it is a forest dweller, it likes rather open wood-

land or woods with frequent clearings, and the turkey's apparent abundance in the East in pre-colonial days indicates that the forests were not as dense as many have supposed. Not only did the Indians' cornfields provide openings, but the fires set by nature or by Indians made for open woodlands of the best mast-producing trees—oaks, hickories, and chestnuts—with an understory of fruit-producing small trees and shrubs and a rich, leguminous flora. With the coming of civilization the turkey at first benefited from the clearings in the forest, but as the forests disappeared and hunting became heavier, a decline set in. Today the bird survives in greatest numbers where only 10 to 25 per cent of the land is cleared. After this it begins to decrease and usually disappears when the amount of cleared and cultivated land rises to 50 per cent.

This was originally not a shy species, but the arrival of men with guns soon made it the alertest, wariest, and most difficult to bag of all our game birds. This has enabled it to survive in favorable habitat, even where it is subjected to year-round hunting, including the deadly water-hole hunting of late summer. It has gone, however, from many areas which, under proper management, could support from 2 to 5 birds to the square mile (under ideal conditions a square mile can support 15 to 20 birds). Proper timber cutting generally improves turkey habitat, once the lumbering operation is over. Removal of trees more than 12 to 16 inches in diameter opens the canopy and stimulates the understory and ground cover, yet leaves plenty of middle-aged trees as mast producers. Extensive clear cutting, by contrast, destroys an area as turkey habitat for many years to come, as the dense, even stand that follows is of little use to the birds except for roosting. In some places within recent years deer have been allowed to increase to such disastrously high levels that they not only compete seriously for mast but so damage the food plants of the forest floor that the area becomes unsuitable for either turkey or grouse. Free-ranging hogs also give serious competition for acorns and mast, and cattle, if allowed in the woods, destroy many important food plants. In some areas in the Southwest new turkey habitat has been created by overgrazing, which has caused much once fine grassland to grow up to scrub oak, juniper, and other turkey-food-bearing plants. A fine change for turkeys, but calamitous in terms of human economy.

In the East the loss of the chestnut was a heavy blow to turkeys and other mast feeders. Beechnuts are produced in

large quantities only once in every few years, and today the staple food of the wild turkey is acorns. Fruits of the dogwood, grape, smilax, and sumac families are important, and grasses are widely eaten, the birds stripping the seed heads in summer and fall and taking the new blades in late winter and early spring when other foods are scarce. Actually there is little that turkeys miss as they range through woods and clearings, eating flower heads and leaves of herbaceous plants, picking up grasshoppers and other insects, and scratching for tubers and roots. In a group of turkey stomachs that were studied 354 species of plants and 313 kinds of insects and small animals were found. Turkeys like corn and will also make intensive use of small woodland-clearing plantings of a mixture of cowpeas, soybeans, millet, and buckwheat. A fall planting of wheat, oats, or rye provides valuable green food, and chufa plantings furnish small tubers that the birds can scratch out during winter.

Although they do not have a fixed gobbling territory, turkey cocks drive other mature males from their vicinity and mate with as many females as they can attract. Not until late summer do they lose their belligerency and gather into small gobbler flocks for the fall and winter. Hens stay with their broods until spring, several families joining to form a flock. The precocial young develop rapidly and are able to fly well enough at 4 weeks to start roosting in trees. For roosting, turkey flocks prefer a sheltered stand of fairly large dense pines, where they scatter out and perch near the trunk well up in the tops of the trees. The roost is, in a sense, their home. From it the average flock ranges over some 4 or 5 square miles in the daily search for food and water. During exceptionally bad winter weather turkeys may remain in the roost a week or more, virtually without food except for an occasional visit to a nearby honeysuckle tangle for a few leaves and berries. Turkeys much prefer running to flying and can attain speeds of 15 or more miles per hour when on the ground. But they are strong fliers and, when necessary, can rise to the treetops at a 30-degree angle and then sail off with only an occasional wingbeat for a quarter to a full mile. In this they are greatly aided if the country is rough enough to permit them to sail from one side of a valley to another, as several flights in rapid succession in more or less flat country completely exhaust them.

VOICE: The cock's gobble is most often heard just after sunrise in spring and serves to guide females to him. He answers

distant gobbles or imitations and often gobbles in response to other loud noises like the calls of crows or great horned owls. The birds of a scattered flock use a low, quavering yelp—*keow, keow, keow*—to locate one another when reassembling.

NEST: (I. 28, P.) A slight depression in the ground, lined with a few leaves which are pulled over the eggs when the hen leaves the nest. The site is usually near a woodland opening or woods road in a place where the nest is well concealed by low growths. Occasionally it is under a small tree or thicket in an abandoned field. The 11 or so eggs (2.7×1.8) are pale buff, evenly spotted with purplish-gray.

RANGE: (R.) Occurred at one time from s. Maine, s. Ontario, s. Wisconsin, and South Dakota; south to s. Florida, the Gulf Coast, and c.w. Mexico; west to Colorado, Arizona, Sonora, and Colima. Now extirpated or present only as small remnants or recent reintroductions in many parts of the original range.

CRANES, RAILS and ALLIES

Order Gruiformes

CRANES

Family Gruidæ

Whooping Crane*

Grus americana—~~17~~ 17
L. 50, W. 90

IDENTIFICATION: When the pure-white adults take flight the jet-black primaries are very conspicuous and the fully outstretched head and neck distinguish them from herons. Young are similar, but the white plumage is irregularly washed with reddish-brown.

HABITS: These big white birds with calls that can be heard for several miles were always conspicuous in the flat open marshes and prairies that were their normal habitats. As civilization moved west and north over the Great Plains they found it increasingly difficult to find sufficiently secluded

places for nesting and gradually disappeared. Whooping cranes travel about a marsh largely on foot, their long stride enabling them to cover ground at amazing speed. When disturbed they rise only a few feet and move off with a slow, deep downstroke and a quick upstroke. In migration they travel at great heights in long lines and V's, from which their clamorous notes descend to earth. Family ties seem to be strong, as the adult pair and their 1 or 2 young remain together through the winter. Little is known of their feeding habits, but they appear to eat many kinds of marsh animals—such as frogs, snakes, crabs, and crayfish—as well as roots and tubers of marsh plants. They also visit fields to eat waste grains and browse on the new leaves of winter wheat.

VOICE: Sonorous trumpeting notes varying in pitch but always with a strong, vibrant overtone or roll.

NEST: (P.) A mass of marsh vegetation forming a flat mound with a slight depression in the center and located well out in an extensive open marsh, usually in the center of an area of open water from which the birds have removed the plants in building the nest. The 2 buffy-colored eggs (3.9 x 2.5) are blotched with various shades of brown.

RANGE: (P. M.) Once bred from Hudson Bay and n. Mackenzie south through the Great Plains to Iowa and Nebraska and in the coastal marshes of Louisiana. Wintered in the Gulf Coast States from Florida to Texas and south to c. Mexico. In migration occurred regularly on the Atlantic coast from New England south. Now reduced to a single remnant wintering in the Aransas National Wildlife Refuge on the Texas coast and migrating north through Nebraska, s. Manitoba, and Saskatchewan to unknown northern breeding grounds.

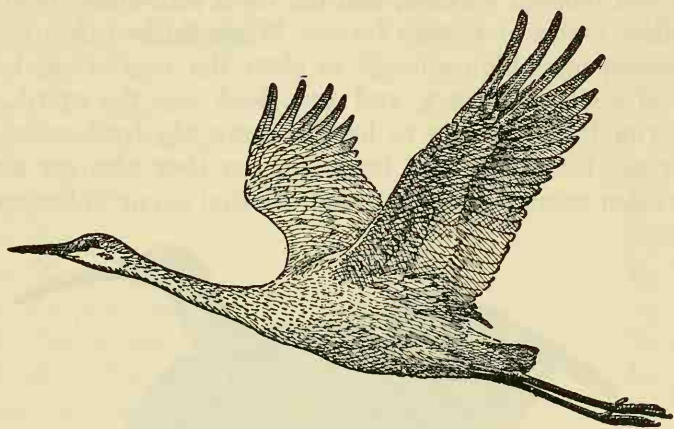
Sandhill Crane*

Grus canadensis—~~17~~
L. 44; W. 80

IDENTIFICATION: Adults are uniformly gray except for the red color of the bare skin of the head, a marking which the brown young lack. The heavy body, long curved tertiaries, striding walk, and, in flight, the outstretched neck and flick of the wing on the upstroke are good identification marks.

HABITS: Although essentially a bird of open country, the sandhill crane occurs at times in relatively small marshes and patches of prairie in forested country. In the South, where it is a permanent resident, it also inhabits open pine woodlands interspersed with grassy openings and ponds. A small

northern race is still common in parts of the Arctic, where it ranges from the low-lying grass tundra well up into rolling hill and mountain country. Good to eat and long regarded as a game bird, these splendid cranes have decreased or disappeared as breeders from the more settled parts of their once vast grassland range. Except when nesting they are very gregarious. They migrate in great flocks, often, like hawks, making use of thermal updrafts. At night they roost on the ground in a safe place like a sand bar or secluded pond. Like all cranes, the sandhill has a remarkable courtship dance. The birds bow to each other, jump into the air with wings held out loosely and feet thrown forward, then turn, bow again, and repeat. They walk long distances while feeding and eat chiefly roots and tubers, waste grains and other seeds, berries and tender vegetation. Mice, lemmings, crayfish, frogs, snakes, and insects appear to be taken in small quantities as opportunity offers.



VOICE: A loud, deep, rolling croak or vibrant honking that sounds like *gur-roo* or *gar-oo-oo-oo*.

NEST: (P.) A flat mound of marsh vegetation, much of it whole plants pulled up by the roots, in very open and usually moist country. Extensive marshlands, grass-covered tundra, or small ponds in open prairies are common sites. The shallow depression for the eggs is often only a few inches above water, but the nest may be 4 or 5 feet across and is invariably surrounded by open water. The 2 buffy eggs (3.6 x 2.3) are marked with browns.

RANGE: (P. M.) Breeds from Baffin Island, n. Mackenzie, n. Alaska, and n.e. Siberia south to s. Florida and Cuba, s.

Mississippi, Nebraska, Arizona, and n. California. Winters from s. Georgia, the Gulf Coast, and California south to c. Mexico.

LIMPKINS

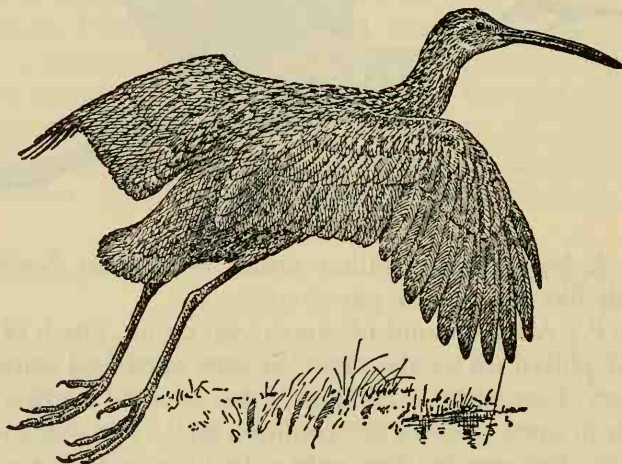
Family Aramidae

Limpkin*

Aramus guarauna—#17
L. 26; W. 42

IDENTIFICATION: The white spots on head, neck, and upper body are distinctive, as is the cranelike flick of the wings in flight.

HABITS: These largely nocturnal birds frequent fresh-water marshes and marshy riverbanks, where they feed along the edges of the denser clumps of marsh vegetation in the manner of rails. Nearby trees and shrubs are commonly used as resting and lookout perches, and the birds sometimes feed in the shallow water of swamp forests. When flushed they rise with dangling legs, high enough to clear the vegetation, leisurely fly off a short distance, and drop back into the marsh. Their favorite food appears to be the same big fresh-water snails that the Everglade kite feeds on, but they also eat many of the other small forms of animal life that occur in the marshes.



VOICE: The loud, ringing *kr-ows* of the limpkin usually commence at sundown and continue through the night. There is some variation, but they all sound surprisingly like human wails or howls and give rise to many local names, such as "crying bird."

NEST: (P.) A large, loosely woven mass of leaves and stems of emergent marsh plants, anchored just above the water to growing stalks and located on the open water edge of a dense clump of vegetation. Limpkins also build rather fragile platformlike nests 1 to 15 feet above the ground in thick tangles of vines growing over shrubs on marsh or stream banks. The 5 or 6 buffy eggs (2.3×1.7) are boldly marked with dull browns.

RANGE: (R.) Occurs from s. Georgia and s. Mexico south through Florida and the Greater Antilles to e. Argentina.

Comparative Average Lengths of Waders

SPECIES	OVER-ALL LENGTH	BILL	LEGS
Black Rail	$5\frac{1}{2}$	$\frac{1}{2}$	$\frac{7}{8}$
Least Sandpiper	6	$\frac{3}{4}$	$\frac{3}{4}$
Semipalmated Sandpiper	$6\frac{1}{4}$	$\frac{3}{4}$	$\frac{3}{4}$
Snowy Plover	$6\frac{1}{4}$	$\frac{5}{8}$	1
Western Sandpiper	$6\frac{1}{2}$	1	$\frac{7}{8}$
Red-necked Phalarope	7	1	$\frac{3}{4}$
Ringed Plover	7	$\frac{1}{2}$	$\frac{7}{8}$
Piping Plover	7	$\frac{1}{2}$	$\frac{7}{8}$
Yellow Rail	7	$\frac{1}{2}$	$\frac{7}{8}$
Spotted Sandpiper	$7\frac{1}{2}$	$\frac{7}{8}$	1
White-rumped Sandpiper	$7\frac{1}{2}$	1	1
Baird's Sandpiper	$7\frac{1}{2}$	$\frac{7}{8}$	1
Thick-billed Plover	$7\frac{1}{2}$	$\frac{7}{8}$	$1\frac{1}{8}$
Curlew Sandpiper	8	$1\frac{1}{2}$	$1\frac{1}{4}$
Sanderling	8	1	1
Buff-breasted Sandpiper	8	$\frac{5}{8}$	$1\frac{1}{4}$
Stilt Sandpiper	$8\frac{1}{2}$	$1\frac{3}{8}$	$2\frac{3}{4}$
Solitary Sandpiper	$8\frac{1}{2}$	$1\frac{1}{4}$	$1\frac{1}{8}$
Red Phalarope	$8\frac{1}{2}$	$\frac{7}{8}$	$\frac{7}{8}$
Dunlin	$8\frac{1}{2}$	$1\frac{1}{2}$	1
Turnstone	$8\frac{1}{2}$	$\frac{7}{8}$	1
Jaçana	$8\frac{1}{2}$	$1\frac{1}{4}$	$2\frac{1}{8}$
Sora	$8\frac{3}{4}$	$\frac{3}{4}$	$1\frac{1}{4}$
Wilson Phalarope	9	$1\frac{1}{4}$	$1\frac{1}{4}$
Pectoral Sandpiper	9	$1\frac{1}{8}$	$1\frac{1}{8}$
Purple Sandpiper	9	$1\frac{1}{4}$	$\frac{7}{8}$
Mountain Plover	$9\frac{1}{4}$	$\frac{7}{8}$	$1\frac{5}{8}$
Virginia Rail	$9\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{3}{8}$

SPECIES	OVER-ALL LENGTH	BILL	LEGS
Ruff	10	1 $\frac{1}{4}$	1 $\frac{3}{4}$
Killdeer	10	$\frac{3}{4}$	1 $\frac{1}{2}$
Lesser Yellowlegs	10 $\frac{1}{2}$	1 $\frac{3}{8}$	2
Knot	10 $\frac{1}{2}$	1 $\frac{3}{8}$	1 $\frac{1}{4}$
American Golden Plover	10 $\frac{1}{2}$	$\frac{7}{8}$	1 $\frac{3}{4}$
Corn Crake	10 $\frac{1}{2}$	$\frac{7}{8}$	1 $\frac{1}{2}$
Woodcock	11	2 $\frac{3}{4}$	1 $\frac{1}{4}$
Common Snipe	11 $\frac{1}{4}$	2 $\frac{5}{8}$	1 $\frac{1}{4}$
Black-bellied Plover	11 $\frac{1}{2}$	1 $\frac{1}{8}$	1 $\frac{3}{4}$
Dowitcher	12	2 $\frac{1}{2}$	1 $\frac{3}{8}$
Lapwing	12	1	2
Upland Plover	12	1 $\frac{1}{8}$	1 $\frac{7}{8}$
Purple Gallinule	13	1 $\frac{1}{4}$	2 $\frac{3}{8}$
Eskimo Curlew	13 $\frac{1}{2}$	2 $\frac{1}{4}$	1 $\frac{3}{4}$
Gallinule	13 $\frac{1}{2}$	1 $\frac{3}{8}$	2 $\frac{1}{8}$
Greater Yellowlegs	14	2 $\frac{1}{8}$	2 $\frac{1}{2}$
Black-necked Stilt	14 $\frac{1}{2}$	2 $\frac{3}{8}$	7 $\frac{1}{2}$
Hudsonian Godwit	15	3	2 $\frac{1}{4}$
Willet	15	2 $\frac{1}{8}$	2 $\frac{1}{4}$
Clapper Rail	15	2 $\frac{1}{4}$	2
Coot	15	1 $\frac{3}{8}$	2 $\frac{1}{8}$
Bar-tailed Godwit	16	3 $\frac{1}{4}$	2
Whimbrel	17	3 $\frac{1}{2}$	2 $\frac{1}{2}$
King Rail	17	2 $\frac{1}{2}$	2 $\frac{1}{2}$
Avocet	18	3 $\frac{1}{2}$	6
Marbled Godwit	18	4 $\frac{1}{2}$	2 $\frac{3}{4}$
American Oyster-catcher	19	3 $\frac{1}{2}$	2 $\frac{1}{4}$
Long-billed Curlew	23	6	3 $\frac{1}{4}$
Limpkin	26	4 $\frac{1}{2}$	4 $\frac{1}{2}$

RAILS, GALLINULES and COOTS

Family Rallidae

King Rail*

Rallus elegans—~~13~~
L. 17; W. 24; Wt. $\frac{3}{4}$ lb.

IDENTIFICATION: The distinctly brownish color, bright reddish-brown breast, and large size are distinctive. The downy chicks are black with pale bills. Immature birds are darker above than adults but only faintly buffy below.

HABITS: Although not quite as secretive as most rails, these birds are seldom seen and usually have to be identified by their calls. Fortunately they are often quite noisy just before dawn and after sundown. When flushed they afford little more than a glimpse as, with dangling legs, they flutter off. If pressed this species can swim and dive, but it prefers to escape by running. It is generally a fresh-water marsh rail, widely distributed wherever rank growths occur in damp ground and commonly ranging into adjacent hay- and grainfields for grasshoppers and waste grain. In the marsh its food consists of the seeds of marsh plants and aquatic animal life. Year after year the king rail, along with a host of other fresh-water marsh species, is becoming scarcer as more and more of its habitat is destroyed by mosquito control or agricultural drainage, or flooded by the construction of power and irrigation reservoirs. We can, however, help these birds to some extent by fencing off the borders of such ponds and marshes as do survive so that cattle cannot beat down and destroy the nesting cover.

VOICE: The calls vary from a series of deep, grunting *umph*, *umph* notes and clucks that sound like a farmer urging on a horse to a series of *kick*, *kick*, *kick* sounds. They are quite deep in tone, all on the same pitch, and are uttered slowly and deliberately except when occasionally they are run together into a rapid jumble that ends with a few slower notes.

NEST: (I. 21, P.) A grass-lined depression in damp ground near a marsh, or a well-built, deeply hollowed cup of leaves and stalks supported above the water on a sedge tussock, bush, or dense patch of marsh plants. When possible the surrounding vegetation is pulled and woven into an arch over the nest. The 10 or so pale buffy eggs (1.6 x 1.2) are sparingly marked with browns.

RANGE: (P. M.) Breeds from Massachusetts, c. New York, s. Ontario, s. Minnesota, and Nebraska south to s. Florida, Cuba, and the Gulf Coast to Texas. Winters in the South Atlantic and Gulf States.

Clapper Rail*

Rallus longirostris—~~13~~ 13
L. 15; W. 20

IDENTIFICATION: The generally pale, grayish appearance and only slightly brown under parts are distinctive. Young birds are similar to young king rails.

HABITS: The harsh, vociferous clatter of these rails is one of the

commonest salt-marsh sounds. The birds are at their noisiest just before a storm and at dusk, but any loud sound may start a chorus of calls, the first bird being answered by others. Clapper rails live and nest at the mercy of high spring and storm tides that destroy nests, float the eggs into windrows along the beaches, or set the hen and her brood of chicks afloat. Although they can swim well for a short time, rails soon perish unless they can reach high ground or climb on a floating log. In the fall these same conditions make them excessively vulnerable to hunters, who often take a heavy toll. They feed largely at low tide on the mud flats and along the banks of the marsh creeks, where their large, chickenlike tracks (some 10 inches apart) are conspicuous. When walking they bob their heads and twitch their tails, which are held almost vertical, revealing white under coverts. Fiddlers and other crabs and crustacea, mussels, snails, and worms are their chief foods.

As all crustacean animals, such as crabs and shrimps, are very susceptible to D.D.T. poisoning, the rails and many shore birds that use them for food are serious sufferers when the public demand for mosquito control results in the wholesale use of this deadly poison on our coastal marshes and beaches.

VOICE: A rough, grating series of staccato *cac cac cac* notes that often diminish in volume and pitch toward the end. Also more abrupt single or widely spaced *keck* notes and grunts.

NEST: (P.) On the ground in a dense clump of vegetation on the highest place available in the open salt marsh. The nest, which is hidden by an arch of nearby vegetation, varies from a simple grass-lined depression to a well-cupped mass of grass and stems rising as much as a foot above the ground. Usually a well-defined runway leads to it. The 9 to 12 eggs (1.7 x 1.2) are buffy with brown spots.

RANGE: (P. M.) Breeds in the salt marshes of both coasts from Connecticut to s. Florida, the West Indies, Mexico, and Central America to s. Brazil, and from c. California to n.w. Peru. Winters from Virginia and c. California south.

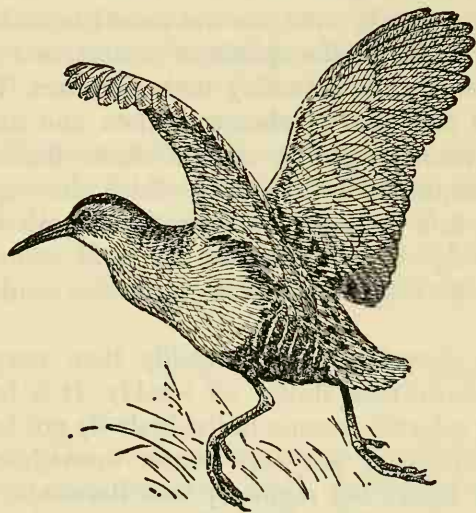
Virginia Rail*

Rallus limicola—~~13~~
L. 9½; W. 14; Wt. 2½ oz.

IDENTIFICATION: Adults are like king rails except for their small size and gray cheeks. Juveniles are largely blackish. The downy black chick has a yellowish bill with a black band

across the middle. In flight the reddish forewing is conspicuous in all plumages.

HABITS: Although active by day, these rails stick so close to the dense vegetation of the fresh or semi-brackish marshes in which they live that they are hard to find. The Virginia's calls, however, reveal its presence, and while most frequent at dawn and dusk, they are heard at all hours. If flushed, which is difficult, as they prefer to escape by running, the birds flutter away with feet dangling for only a few yards before dropping back into the marsh. It is hard to realize that they migrate long distances, flying always at night. The food of this species is drawn from the small animal life of the marsh, ranging from small fish to insects. It also eats seeds and berries, climbing about the plants to get them, and it visits weed-grown fields after the harvest.



VOICE: The courtship call is a vibrant, metallic *kid-ick, kid-ick, kid-ick*, often likened to the sound of a telegraph instrument or a hammer bouncing off an anvil. A descending series of piglike grunts is common, and there are also rough, shrill, discordant squeals and other equally odd calls.

NEST: (I. 19, P.) In a fresh or occasionally slightly brackish cattail or sedge marsh. The nest is a loosely woven structure of grass and stems anchored to the stalks of a clump of vegetation a few inches to a foot above the mud or water. The 8 eggs (1.3 x .91) in an average clutch are pale buff, sparingly spotted with russet-brown.

RANGE: (P. M.) Breeds from Nova Scotia, s. Quebec, s. Ontario,

s. Manitoba, and s. British Columbia south to North Carolina, Kentucky, Missouri, Utah, and n. Lower California. Also c. Mexico and much of South America to the Strait of Magellan. Winters from s. New Jersey, s. Illinois, Colorado, and s. British Columbia south to Cuba and Guatemala.

Sora*

Porzana carolina—~~X~~ 13
L. $8\frac{3}{4}$; W. $13\frac{1}{2}$; Wt. 3 oz.

IDENTIFICATION: The heavy, short, chickenlike yellow bill and, in adults, the black face are good field characters. The female is duller, less black about the face, and has more white spots than the male. The downy black chicks have orange throats and yellow bills with enlarged red bases.

HABITS: The sora, our most abundant rail, ranges over most of the continent, nesting in every little fresh-water marsh, bog, or riverside reed patch, even on the outskirts of large cities. A clap of the hands or the splash of a stick or rock will often start a series of calls revealing their presence. They are very curious and can best be observed when one sits still on the edge of a marsh opening toward dusk. Before long these laterally compressed birds—from which the expression “thin as a rail” comes—slip out between the cattails to work along the marsh edge and out on the lily pads and other floating vegetation, picking up insects, mollusks, and other small animals.

Although they flush more readily than some rails, soras seldom do more than flutter off weakly. It is hard to realize that during migration some individuals fly not less than 3,000 miles and that they not only winter throughout the islands of the West Indies but regularly visit Bermuda, often in considerable numbers. Migration flights are performed at night, usually at such low elevations that many birds are killed by striking buildings or other obstructions. The sora's habit of completely evacuating a marsh the night of the first frost often produces great migratory waves. In fall the birds become seedeaters and concentrate in tremendous numbers wherever they find extensive beds of wild rice. The broad marshes along the lower reaches of coastal rivers are much frequented and, to some extent, the salt marshes. Inland they visit corn and grain stubble fields, rank weed growths, and brushy hillsides. Despite heavy hunting and heavy migration losses, these prolific birds, laying clutches up to 14 or 18 eggs, which have to be arranged in 2 or 3 layers for the bird to

cover them, remain abundant so long as their habitats are intact.

VOICE: The spring call is a clear, plaintive, quail-like ascending *ker-wee* that in the distance sounds like a spring peeper. This is repeated over and over with monotonous regularity, often during the day as well as at night. The sora's most characteristic call is its "whinny," a rapid series of a dozen or more clear, pleasing notes run together on a descending scale, becoming weaker as it slows down and levels off in pitch at the end. The bird has other short peeping calls, common ones being *ca-weep-eeep* or a single *keek*.

NEST: (P.) A cup woven out of dead leaves and anchored to growing cattails or other marsh plants a few inches above water, or a large pile of such material placed on top of a sedge or grass tussock. The usual site is in or near a fairly open place in the marsh, but occasionally the nest is on the ground in low-lying meadowland or crop fields. Often an arch made of the surrounding vegetation hides the eggs. The 11 or more eggs (1.2 x .89) are yellowish-buff with numerous dull brown spots.

RANGE: (P. M.) Breeds from Nova Scotia, s. Quebec, n. Ontario, s. Mackenzie, and c. British Columbia south to Maryland, s. Ohio, s. Illinois, Kansas, Utah, and n. Lower California. Winters from n. Florida, the Gulf Coast, Texas, Arizona, and California south to Venezuela and Peru.

Yellow Rail*

Coturnicops noveboracensis—~~13~~ 13
L. 7; W. 12; Wt. 2¼ oz.

IDENTIFICATION: The small size, yellowish color, and strongly striped upper parts are good field characters, and the conspicuous white patch in the hind wing next to the body is diagnostic if the bird flies.

HABITS: This bird is more of a mystery than any other North American species of comparable distribution. It nests in shallow fresh marshes and wet meadows where grasses a foot or two high predominate, instead of in the taller, denser vegetation like cattails, which most rails prefer. At other than the breeding season they are found in the higher parts of the coastal salt marshes as well as in moist grain- and hayfields. As they are virtually impossible to flush and seem to avoid open places, they are seldom detected except by their notes. So loath are they to fly that a trained dog can often catch them. Most specimens have been obtained with the help of

dogs or through mowing or beating down a long lane in the grass and driving the rails across it. This species seems to be hardy and often remains in northern marshes until late fall. The only food they have been recorded as eating is small snails.

VOICE: A series of 5 clicking notes broken by a pause between the second and third—*kuk, kuk—kuk, kuk, kuk*; occasionally a series of 7 or 8 short notes ending with a long, rising *queah*. These notes have been likened to the sound made by hitting 2 stones together, tapping a hollow bone with a piece of iron, or driving a tent peg into hard ground.

NEST: (P.) A well-made cup of fine grass placed just above the shallow water of a grass marsh, on a grass tussock, or in a mat of old dead grass. Occasionally in drier locations the nest is on damp ground. Regardless of the site, it is usually placed so that the eggs are hidden from above by a wisp of old grass. The 8 or 9 eggs (1.1 x .82) are a warm buff with a dense cluster of reddish-brown spots at the large end.

RANGE: (M.) Occurs during the breeding season from Nova Scotia, c. Quebec, n. Manitoba, and s. Mackenzie south to Maryland, Ohio, Missouri, Colorado, and c. California. Winters from South Carolina to s. Florida and across the Gulf States to California.

Black Rail*

Laterallus jamaicensis—~~13~~ 13
L. 5½; W. 11

IDENTIFICATION: This black-billed little rail with its white-spotted back is unmistakable if seen clearly. The downy black chicks of the larger rails are sometimes called "black rails."

HABITS: This still smaller species runs a close second to the yellow rail as a bird of mystery. It is almost as hard to flush except at extreme high tides. The normal glimpse is of a mouselike animal darting away through grass. The salt-hay meadows and Salicornia flats on the highest parts of the coastal marshes, which are reached only by the highest tides, are its home. Where vegetation has gone unburned for several years these areas are covered with a dense mat of old grass under which the birds live. Their only recorded food is isopods—enormously abundant small crustacea that feed on dead or decaying plant material in the salt marsh. Inland, black rails have occurred in the damp, grassy upper borders of marshes.

VOICE: Notes of the female are described as a *croo-croo-croo-o*,

like the opening of a yellow-billed cuckoo's song, while those of the male are a *kik, kik, kik, kik*. Another call has been described as *did-ee-dunk* repeated 3 times.

NEST: (P.) A loose cup of fine, soft grass hidden under a tuft of bent-over but not smoothly matted old marsh grass or under a carefully woven arch of growing green grass. The nest is sometimes directly on the damp ground but more often is supported by the mat of last year's grass in which it is built. The 7 or so eggs (1.0 x .78) are buffy-white, evenly dotted with fine brown spots.

RANGE: (P. M.) Breeds from Massachusetts, s. Ontario, and Minnesota south to Florida, Illinois, and Kansas; on the Pacific coast from c. California to n. Lower California, and in South America to Peru and Chile. Winters from s. Florida and the Gulf Coast to the Greater Antilles and Guatemala, and along the Pacific coast from California south.

Corn Crake*

(Land-rail)

Crex crex—~~12~~
L. 10½

IDENTIFICATION: The bright chestnut-brown wings, the large size, and generally yellowish appearance are distinctive.

HABITS: Like our sora, this bird, the common land rail of Europe, is a strong flier and migrates many thousands of miles annually. In view of this it is not too surprising that from time to time individuals stray from their normal migration routes and reach North America. The corn crake is not a marsh bird but a frequenter of grasslands and agricultural croplands, especially clover, and to some extent grainfields. Back in the 1870s an attempt was made to introduce them into this country, but, like most such efforts, it came to nought. The food is chiefly insects, plus a few slugs and earthworms, and some seeds and grain.

VOICE: The spring call is a loud, rasping sound as of a piece of wood being drawn across a comb.

NEST: (I. 17, P.) A cup of grasses on the ground in low-lying meadows, hayfields, or in dense weeds or grainfields. The 10 or so eggs (1.5 x 1.0) are grayish or brownish, splotted with brown.

RANGE: (M.) Breeds from the Faeroes and the Arctic Circle in Norway east to c. Siberia and south to n. Spain, Bulgaria, n. Persia, and the Altai. Winters throughout most of Africa. Has occurred along the Atlantic coast from Greenland to Maryland.

Purple Gallinule*

Porphyryla martinica—~~12~~
L. 13; W. 22

IDENTIFICATION: The yellow legs, blue frontal plate, and solid white under tail area are distinctive. The black down of the chicks is mixed with white hairs about the head, and the bill is yellow with a black outer end.

HABITS: This gem of the marshlands is a rather fearless bird, likely to be seen walking over the floating plants in the deeper areas of the marsh or along roadside ditches. Here it picks up frogs, small snails and other mollusks, aquatic insects and seeds from lily pads, spatterdock, and water lettuce. The purple gallinule flies quite readily with its long yellow legs dangling like a rail's, and as it walks it constantly and rapidly flicks its tail. It can alight readily on branches and frequently climbs about in shrubbery over water. In fall in some areas it visits rice and other grainfields, where it climbs up stalks to feed on the seed heads.

VOICE: This noisy bird utters henlike cackles as it flies, and it has many other guttural notes. The commonest call has been described as a "harsh, shrill, rapid, laughin g hiddy-hiddy-hiddy, hit-up, hit-up, hit-up," the latter part of slow delivery.

NEST: (P.) Usually in islandlike patches of tall, dense marsh vegetation surrounded by open water-lily marsh. In some areas clumps of wampee are the preferred site. The nest is a saucer-shaped platform of grass and stalks, supported a foot or more above the water by surrounding vegetation. In addition to the active nest, several dummy nests are built. The 6 or so eggs (1.5 x 1.1) are pinkish-buff, finely dotted with brown.

RANGE: (P. M.) Breeds from South Carolina and the Gulf States west to s.c. Texas and south through Mexico and the West Indies to Peru and n. Argentina. Winters from c. Florida and s. Texas south.

Gallinule*
(Moorhen)

Gallinula chloropus—~~12~~
L. 13½; W. 21; Wt. 14 oz.

IDENTIFICATION: A ducklike bird, without a duck's bill, which continually bobs its head as it swims. The red bill, the white lines along the sides (in adults), and the divided white under tail coverts are distinctive. The downy black chicks have a few white-tipped hairs and show bare reddish skin on top of the head and at the base of the black-tipped red bill.

HABITS: (Age $5\frac{1}{2}$ yrs.) Fresh-water marshes with frequent openings where cattails or other emergent vegetation grows in a foot or more of water are the typical habitat of this rather slender, long-necked bird that swims with stern high and tail up, revealing its white underside. The marsh need not be large; often a small bed of cattails on the edge of a lake or river is sufficient. The birds are not particularly shy and are often seen prowling about in the open near the margins of denser clumps of reeds. Civilization seldom disturbs them so long as their habitat remains intact. The "water hen" feeds both on land, where it walks with frequent jerks of its tail and flashing its under tail coverts, and in water, where it walks on floating vegetation or swims, dives, and tips up like a duck. Food includes snails, insects, and other small animals and many seeds and berries but vegetation seems to be their staple, as the birds regularly consume quantities of under-water plants, duckweed, and leaves of grass and herbs.

VOICE: These noisy birds have a variety of often chickenlike notes, and they seem constantly to be conversing with one another. Most calls are loud, rather harsh, and often complaining. Usually 4 or 5 squawks are followed by a series of clucks or abrupt froglike *kups*.

NEST: (I. 21, P.) A shallow cup of old dead rushes, cattails, and stems of marsh plants, usually over water, anchored a few inches from the surface in a clump of vegetation or semi-floating, with a sloping entrance ramp on the side. Occasionally in shrubbery near water. The site is usually near open water on an islandlike tussock or in the edge of a large reed bed. Several nestlike platforms are usually built and may be used for brooding the young. The 11 or so eggs (1.7×1.2) in an average clutch are buffy, irregularly splashed with brown.

RANGE: (P. M.) Occurs virtually all over the world, except in Australia, including practically every island, even to Bermuda, Hawaii, and the Azores. In the Western Hemisphere breeds from s. Maine, s. Ontario, s. Minnesota, Nebraska, Arizona, and c. California south and winters from South Carolina, the Gulf Coast, and s. California south.

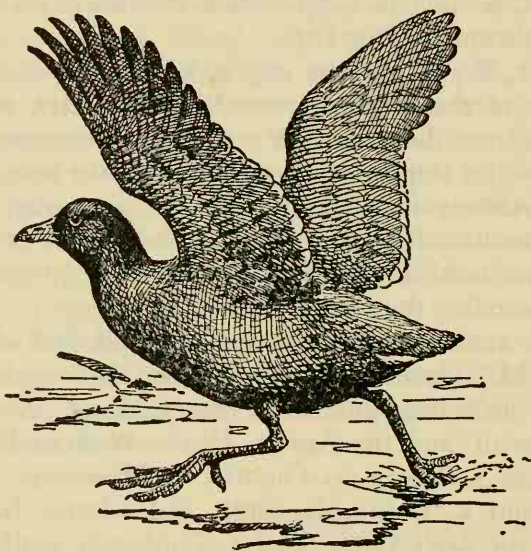
American Coot*

Fulica americana—~~12~~
L. 15; W. 26; Wt. $1\frac{1}{4}$ lbs.

IDENTIFICATION: The white bill, outer under tail coverts, and the rear edge of the inner wing are distinctive. Young are considerably whiter below and have a duller bill. The black

down of the chicks is mixed with conspicuous tawny-reddish, curly hairs around the head and neck.

HABITS: The coot is the most aquatic member of its family. Its toes have developed expanded pads to aid in swimming, and it is as much at home in the water as a duck. It swims buoyantly on even keel, nodding its head as it goes. In feeding it tips up like a duck and if necessary dives like a grebe. When taking wing it has to run over the surface for quite a distance. When fighting or defending itself it relies mainly upon its powerful, sharp-clawed feet. During breeding season the birds largely confine themselves to shallow marsh-fringed ponds or open fresh-water marshes, but at other times they associate freely with ducks on all types of water, including, on occasion, brackish and salt bays. Underwater plants are staple foods, but the coot's great fondness for chara or musk grass and other algae usually keeps competition with ducks at a minimum. Coots also feed on land, eating grass, sprouting grains, and, in fall, waste grain. Small aquatic animals are taken as occasion offers.



VOICE: Coots seem to be almost constantly giving vent to a babble of indescribable sounds, accompanied by much splashing and fussing. The notes have been variously described as croaks, toots, grunts, cackles, coughs, quacks, coos, whistles, squawks, chuckles, clucks, wails, and froglike plunks and grating sounds.

NEST: (I. 22, P.) A cup woven out of the dried leaves and stems of marsh plants, usually resting on a floating foundation of the same material and anchored to growing plants. Sometimes well concealed in a dense bed or clump of reeds but often in the open, resting on a matted mass of old reeds with little or no concealment. The 10 or so eggs (1.9 x 1.3) are pinkish-buff, thickly and finely spotted with blackish-brown.

RANGE: (P. M.) Breeds from New Brunswick, s. Quebec, Ontario, c. Saskatchewan, s.w. Mackenzie, and c. British Columbia south to New Jersey, Ohio, w. Tennessee, Arkansas, n.e. Mexico, and s. Lower California. Over parts of this range it breeds only sporadically. It also breeds in c. Florida, the West Indies, s. Mexico, Central America, the Hawaiian Islands, and the n. Andes of South America. Winters from Virginia, s. Illinois, Texas, Arizona, and s. British Columbia south to the West Indies and Panama; a few winter as far north as s. New England and Colorado.

SHORE BIRDS, GULLS, AUKS and ALLIES

Order Charadriiformes

JACANAS

Family Jacanidae

Jacana*

Jacana spinosa—~~12~~
L. 8½

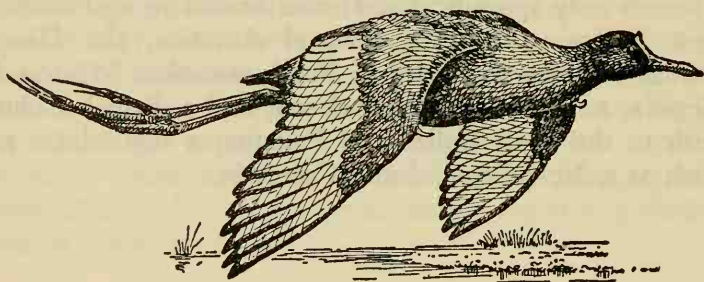
IDENTIFICATION: The long toes, pale yellow-green primaries and secondaries, and, in adults, the yellow frontal plate are distinctive.

HABITS: These curious birds live and nest on the open blanket of water lettuce and other floating plants that often completely cover small ponds, lakes, and old river channels through the American tropics. Their extraordinarily long toes enable them to run over the leaves to catch the insects and other small animals that appear to be their chief food. The birds have the habit of frequently raising and opening their

wings, revealing the conspicuously yellow flight feathers. The bend of the wing is armed with a long sharp spur that is evidently used in fighting. Young birds are the ones most likely to wander north to Florida from Cuba or to s. Texas from Mexico, as happens from time to time.

VOICE: A noisy cackle as they fly, also a plaintive whistle.

NEST: (P.) A fragile cup of leaves of water plants, supported by a lily pad or other floating vegetation, out on the overgrown surface of a pond. The 4 eggs (1.2 x .91) are pale brown, evenly and thickly covered with black scrawls.



RANGE: (R.) Occurs from the Greater Antilles, Tamaulipas, and Sinaloa south to n. Argentina.

OYSTER-CATCHERS

Family Haematopodidae

American Oyster-catcher* *Haematopus palliatus*—#34
L. 19; W. 33

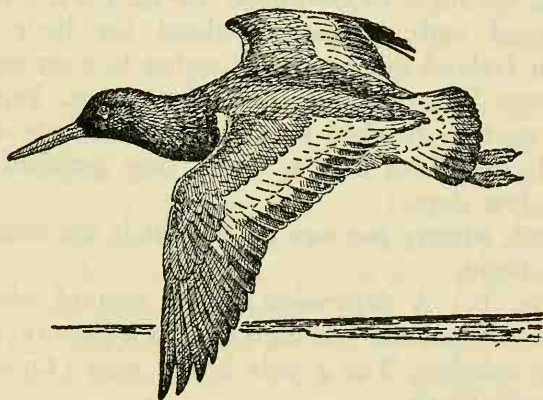
IDENTIFICATION: The large size, red bill, and, in flight, the white upper tail coverts and secondaries make this an easy bird to identify. Young have brownish bills surrounded by whitish feathers, and their feet are grayish.

HABITS: Big, noisy, and conspicuous, the oyster-catcher does not long survive near civilization unless given complete protection. Once reported by Audubon as breeding as far north as s. Labrador, it is now scarce or absent from many parts of our coast. That it may again become more abundant is indicated by the recent history of the closely related European oyster-catcher which still ranges as far north as Iceland and the White Sea. Under protection the European bird is becom-

ing increasingly common in many parts of Great Britain and in some areas is nesting a considerable distance inland along rivers running back through open country. Our bird is today seldom found far from the wilder, outer beaches and the nearby flats, where it feeds on the falling and rising tide. "Coon oysters," mussels, clams, cockles, limpets, snails, marine worms, crabs, and other crustacea are eaten. The bird is expert at opening shellfish by inserting its bill into the partly open shell and cutting the adductor muscle before the animal can close up. It is also at home on rocky coasts and islands, where it feeds on the barnacles and mollusks below the high-tide line. Widely scattered when breeding, oyster-catchers gather into large flocks during winter, when some southward migration occurs.

VOICE: When disturbed, a loud, distinctive, scolding *weeep, weeep, weeep* call that has an insistent, penetrating quality. Also a short, sharp *pie* whistle and a more musical double, ploverlike trill that seems to be the equivalent of a song.

NEST: (I. 22, P.) A simple depression, sometimes with a few bits of shell for a lining, at the top of a slight elevation on the upper beach, on a shell bank, or occasionally on a rock ledge just above water, where the bird commands a good view of its surroundings. The normal clutch is 3 buffy eggs (2.2 x 1.5), irregularly blotched with blackish-brown.



RANGE: (P. M.) Breeds from New Jersey south along the Atlantic, Gulf, and Caribbean coasts to c. Argentina, including parts of the West Indies, and from Lower California along the Pacific and Gulf coasts to s. Chile, including the Galápagos Islands.

PLOVERS and TURNSTONES

Family Charadriidae

Lapwing*

Vanellus vanellus—~~3~~31
L. 12

IDENTIFICATION: The color pattern is unlike that of any American shore bird, and the black crest of adults is unique. The flight is rather unsteady, and the broad rounded wings are flapped rather slowly. The wing lining is white, upper and under tail coverts reddish-brown.

HABITS: Occupying in the Old World a niche rather similar to that of our killdeer, the lapwing has gained vastly in habitat through the spread of agriculture. Though it is the source of the gourmet's "plover's eggs," it remains abundant in the Old World in nearly all reasonably moist farming areas. Plowed croplands, fallow land, and closely grazed pastures in flat, open country, especially if there are occasional marshy spots, provide ideal conditions. Food consists largely of insects picked up in crop fields, but lapwings also take worms and other small animal organisms as well as weed seeds and grain. After nesting they gather in large flocks and roam the country, visiting mud flats, marshes, flooded fields, and other typical shore-bird haunts. Occasional stragglers reach our shores. On the night of December 18-19, 1927, a large flight left Scotland and northern England for their wintering grounds in Ireland but, evidently owing to a strong tailwind and a dense fog, overshot their destination. Persisting on their course, they reached various points in Labrador, Newfoundland, and Nova Scotia, where they perished from the cold in a few days.

VOICE: A loud, wheezy *pee-wee* or *pee-wit* is the common call, uttered in flight.

NEST: (I. 25, P.) A depression in the ground with a grass lining. The normal site is a high spot in a pasture, crop field, or marshy meadow. The 4 pale brown eggs (1.9 x 1.3) are blotched with black.

RANGE: (P. M.) Breeds across n. Europe and Asia from n. Norway to e. Siberia and south to n. Spain, Transcaspia, and n. China. Winters from Great Britain, s. Europe, and China south to n. Africa, n. India, and Japan. An occasional straggler to the e. coast of North America.

Ringed Plover*
(Semipalmated Plover)

Charadrius hiaticula—~~30~~
L. 7; W. 15

IDENTIFICATION: The single complete chest band, short bicolored bill, and bright orange-yellow legs are distinctive. Fall birds have brownish chest bands, and the young have a solid black bill and pale yellow legs.

HABITS: This is a common migrant throughout the United States. It travels in flocks but, like all plovers, scatters out to feed. Mud flats are favorite feeding grounds, and often the backs of the birds so match their surroundings that they are almost invisible until they run. Inland they seek out freshly drained lakes or freshly plowed fields that have been made muddy by heavy rains. Along the coast they are attracted by tidal flats, retiring at high tide to rest in small, compact bunches on the upper beach. They also feed in salt marshes wherever there is a shallow pond, an open mud flat, or an area of short grass such as that produced by mowing or a fire. Inland they occur along the shore line of lakes and rivers, and on the coast they sometimes feed with sandpipers on the edge of the water. Small mollusks, crustacea, and marine worms are staple salt-water foods, while inland aquatic insects and earthworms are taken. When feeding they run about very actively, stopping suddenly from time to time to listen, look, or quickly reach down and grab some small animal.

VOICE: The common call when flushed is a clear, somewhat plaintive double whistle, *chee-wee*. The song, occasionally heard in migration, is a series of short notes uttered faster and faster until they become a whinny or chuckle.

NEST: (I. 23, P.) A depression in sand or on the ground or in moss or lichens near a beach. Like most plovers, these birds sometimes give their nests a slight lining of shells, pebbles, or grass. The site is often near a landmark, like a piece of driftwood. The 4 buffy eggs (1.3 x .93) are boldly to finely marked with blackish-browns.

RANGE: (M.) A circumpolar species, breeding from the shores of the Arctic Ocean south to Nova Scotia, the n. Gulf of St. Lawrence, James Bay, n. Manitoba, and c. British Columbia, and in Europe to the Mediterranean. Winters from South Carolina, the Gulf Coast, and c. California south to Argentina and Chile; from the Mediterranean to c. Africa and n. India.

Piping Plover**Charadrius melodus*—~~30~~
L. 7; W. 15

IDENTIFICATION: The pale gray, sand-colored upper parts, together with the orange-yellow legs, are distinctive. The black ring at the base of the neck is variable in completeness, and in winter adults or young birds this and the black forehead mark may be indistinct or absent.

HABITS: These little birds match the dry sand so perfectly as to be almost invisible, and they often escape by running or crouching motionless in the sand. During summer they prefer beaches with broad, open sandy flats above the high tide line or between dunes. They quickly take advantage of areas where recent grading and filling or disposal of dredging wastes have created sandy flats. Here they nest until the areas grow up too thickly to grass or other vegetation. Much of their feeding is done on wet sands, where they work the edge of the incoming waves along with sandpipers, or, to some extent, on mud flats exposed at low tide. Marine worms, crustacea, and insects appear to be their chief foods. They are early migrants in spring and leave very early in fall to winter in small flocks along southern beaches.

VOICE: A clear, melodious, and rather ventriloquial bell-like *peep-lo*, the first note rather low, the second higher. Also a series of a dozen or so short, clear whistles, often on a descending scale.

NEST: (I. 28, P., N. 33) A depression lined with stones or shells in the loose dry sand of a flat, open upper beach or a recent fill where little or no vegetation has become established. The 4 eggs (1.2 x .95) are pale buff, lightly but evenly dotted with blackish.

RANGE: (M.) Breeds from Newfoundland, s. Quebec, s. Ontario, s. Manitoba, and s. Alberta south on the Atlantic coast to North Carolina, west along the Great Lakes to n. Ohio and n. Illinois and to c. Nebraska. Winters south from South Carolina along the coast to n. Mexico and in small numbers to the n. West Indies.

Snowy Plover*
(Kentish Plover)*Charadrius alexandrinus*—~~30~~
L. 6¼; W. 13½

IDENTIFICATION: A smaller, whiter plover than the piping, with a longer, slenderer bill, slate-gray legs, and a dark ear patch. Young and winter adults lack most or all of the dark mark-

ings and can best be distinguished by bill shape and leg color.

HABITS: Ideal habitat is extensive, dry, flat, barren areas near water where little or no vegetation grows. This the snowy plover finds on the broad expanse of upper beach and nearby sandy flats where occasional storm tides keep vegetation from developing. Inland similar conditions exist where saline or alkaline waters and rapid evaporation have created vast areas of exposed and largely barren flats that are submerged only after very heavy rains. In both these sharply and usually widely separated habitats the snowy plover is often associated with the least tern. The snowy's food is obtained along the water's edge or on the flats. At times it follows the waves on the beach like a sandpiper; at other times it forages for crustacea and flies about dead fish and other material in the sea wrack along the edge of the upper beach. These, plus marine worms and smaller mollusks, must be its chief foods. Saltworks where commercial sea salt is obtained by evaporation are quickly adopted by these birds, who use the low dikes between the ponds for nest sites.

VOICE: The common call is a series of 3 rather low, mellow, whistled notes, the second louder than the others. In flight the bird often utters a low, rapid trill.

NEST: (I. 24, P.) A hollow in the ground on as elevated a site as is available on a broad, open beach or salt flat. There is often a lining of shell, stones, or bits of vegetation. The 3 sandy-buff eggs (1.2 x .88) are dotted or scrawled with black.

RANGE: (P. M.) This species breeds in widely separated areas all over the world, occurring on every continent and in many island groups. In the Western Hemisphere it breeds on the coasts of the Gulf States from Florida to Texas, also Yucatan, the Bahamas, the Greater Antilles, and n. Venezuela; on the Pacific coast from Washington to s. Lower California and in Peru and Chile; inland from n. Utah and Kansas south to New Mexico and n. Texas. Winters from the Gulf Coast and c. California south to Paraguay.

Thick-billed Plover (Wilson's Plover)

Charadrius wilsonia—~~30~~
L. 7½

IDENTIFICATION: The long, heavy, solid-black bill, the white line over the eye, and the dusky-pinkish legs are distinctive. Winter males, females, and young have grayish markings in place of the breeding male's black ones. Some males show considerable rusty-brown on the sides of head and nape.

HABITS: The thick-billed plover makes its home along broad stretches of open sand between the dunes and the lower beach. Inlets with extensive bars, mud flats, and storm-washed points often support small, loose colonies. The birds feed on small seashore animals, including small crabs, shrimp, and other crustacea, insects, and small mollusks.

VOICE: Call notes are a single abrupt *wheet* or a deeper double whistle. Also other higher-pitched runs of whistled notes.

NEST: (I. 24, P.) A depression on the open, sandy beach just above the tides or a similar open flat near water. Occasionally in a hollow among sand dunes. The 3 eggs (1.4 x 1.0) are pale buff, evenly marked with small black dots and scrawls.

RANGE: (P. M.) Breeds from Virginia south to Florida and along the shores and islands of the entire Gulf of Mexico-Caribbean basin. Also on the Pacific coast from c. Lower California to Peru. Winters from the Gulf Coast southward.

Killdeer*

Charadrius vociferus—~~30~~ 30
L. 10; W. 20; Wt. 3 oz.

IDENTIFICATION: The double breast band and orange-brown lower back, rump, and upper tail coverts are distinctive. Young birds are similar but paler and browner above and have grayish breast bands.

HABITS: Heavily grazed meadows and borders of pasture ponds, plowed cropland, and waste places created by grading and filling for roads and railroads are preferred habitats. Few birds appear to have benefited more from the changes incident to the settlement of the country. Although killdeer often feed about wet places they are largely independent of water during the nesting season. Many species do a "broken-wing" act when their nest or young are approached, but few put on as good a show as the killdeer. Alert and noisy, the birds warn the neighborhood when an intruder sets foot in their domain. They are hardy and even in areas where they have to go south for the winter they are gone only a few months, returning with robins as harbingers of spring. In winter they move about in loose flocks, often in association with other shore birds, but seldom in saline coastal areas. Beetles, grasshoppers, and other insects are their most important foods. The balance consists of other small animals.

VOICE: The alarm note is a loud, vociferous *kill-dee* call. A long trill is often heard about the breeding grounds.

NEST: (I. 25, P.) This bird likes an open location for its nest,

which is only a slight depression in the ground, lined with grass. Barren, open spots, plowed cropland, closely grazed pastures, and gravel bars are common sites. The 4 eggs (1.4 x 1.1) are pale buff, blotched and scrawled with blackish. Two broods are sometimes reared.

RANGE: (P. M.) Breeds from s. New England, s. Quebec, n. Ontario, s. Mackenzie, and n. British Columbia south to the Greater Antilles, c. Mexico, and s. Lower California. Also on the coast of Peru. Winters from Bermuda, New Jersey, Ohio, Missouri, Colorado, and s. British Columbia south to n. Venezuela and n.w. Peru.

Mountain Plover*

Eupoda montana—~~30~~
L. 9¼

IDENTIFICATION: The black forehead and lores, the white line over the eye, and the diffuse buff-gray wash on the breast, together with the uniform coloring of the back, are distinctive. Winter adults lack black markings and are best told by their nondescriptness and, in flight, by the pure white of their axillars and wing linings, which contrasts with the gray of their flight feathers. The tail is tipped with white and has a blackish subterminal band.

HABITS: During summer this is a bird of dry, short-grass prairie, miles from water, where the sparse clumps of bunch grass are only a few inches high. From here it ranges into sandy, semi-arid areas with scattered sagebrush and cactus. Open ground seems attractive to the species, as winter flocks are often found on plowed land or on sprouting grainfields, alkaline flats, or closely cropped pastures. Long-legged and very fast afoot, this plover prefers to escape by running. When forced to fly it stays close to the ground, alternately flapping and sailing on decurved wings. Upon alighting it may crouch down and become almost invisible. Its food is largely insects, chiefly grasshoppers, crickets, beetles, and flies.

VOICE: The whistled notes are short and vary in tone from musical and plaintive to shrill, harsh, and lisping. They have been likened to the croaking of a frog.

NEST: A slight depression with little or no lining on bare ground between tufts of short prairie grass. The 3 eggs (1.5 x 1.1) are olive-buff, spotted and scrawled with black about the larger end.

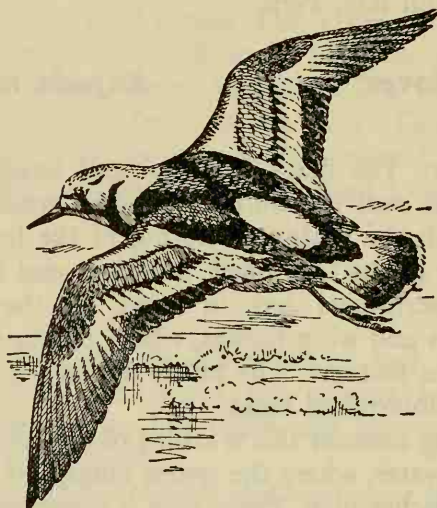
RANGE: (M.) Breeds from w. Nebraska and n. Montana south to n.w. Texas and New Mexico. Winters from s. Texas, s.

Arizona, and n. California south to c. Mexico and s. Lower California, rarely east along the Gulf Coast to Florida.

Turnstone*

Arenaria interpres—~~30~~
L. $8\frac{1}{2}$; W. 18

IDENTIFICATION: Spring adults are so striking as to be unmistakable. Winter adults and young are best told by their orange legs and dark breast patch. At all times turnstones reveal a striking pattern of white and dark when they fly.



HABITS: Stockily built, pugnacious shore birds waddling about on short orange legs, overturning shells, pebbles, and lumps of seaweed or digging holes in the sand as large as themselves, can only be turnstones. They occur in greatest numbers along seacoasts, but some migrate through the interior, where they frequent the shores and beaches of larger lakes. Sandy beaches and pebbly shingle are favorite feeding grounds. Here the birds root like little pigs among the sea wrack along the upper beach and fight vigorously over choice finds. At low tide when seaweed- and barnacle-covered rocks and beds of mussels and oysters are exposed, they seem to find an abundance of food. Although small mollusks, crustacea, and insects are staples, turnstones are quick to take advantage of a variety of items. In various places, especially in the Arctic, they eat quantities of berries, climbing about in the bushes to get them. Horseshoe-crab eggs are taken from the spawning beds, and on Laysan Island turnstones were found systematically breaking and eating tern eggs at every oppor-

tunity. Although generally encountered in small groups when feeding, the birds often migrate in large flocks, either by themselves or with their common associate, the black-bellied plover. At times they can be identified by their un-shore-bird-like habit of perching on vantage points up off the ground.

VOICE: When they take flight turnstones utter a metallic rattle or low chatter, often recorded as *cut-i-cut* or *kek*. They also have a more musical ploverlike whistle.

NEST: A depression in the ground, usually in the open tundra or among dunes near the coast or along rivers or occasionally tucked into a sheltered cavity. The 4 eggs (1.5 x 1.1) are olive-buff, boldly marked with brown.

RANGE: (M.) Breeds on the islands and coasts of the Arctic Ocean south to Southampton Island, the Yukon delta, Iceland, islands in the s. Baltic Sea, lakes in the Kirghiz Steppes, and Kamchatka. Winters from Bermuda, North Carolina, the Gulf Coast, and c. California to s. Brazil and c. Chile; also from Great Britain, the Mediterranean, s. China, and Hawaii south to s. South Africa, Australia, and New Zealand.

American Golden Plover* *Pluvialis dominica*—~~31~~
L. 10½; W. 22; Wt. 6½ oz.

IDENTIFICATION: In breeding plumage this species is black below to the tail and uniformly dusky, flecked with yellowish spots above. The tail is dark. In fall plumage this is a fairly dark brownish-looking bird without conspicuous black or white markings. Young are often very yellowish in the early fall. Compared with a black-bellied, this plover is smaller and slenderer, with a smaller bill and head and longer, more pointed wings that are uniformly grayish below. It also has the habit of holding its wings up over its back for a moment after alighting and of bobbing its head frequently.

HABITS: This is one of the champion long-distance migrants. Once an abundant bird, it is only beginning to recover from the market hunting that almost wiped it out 60 years ago. In spring these plovers all go north through the central part of the country, frequenting freshly plowed fields and the short grass of prairie and pasture. They are especially attracted to recently burned areas. In fall stragglers from the offshore flight turn up along the North Atlantic coast, where they occur in the above types of habitat and with other shore birds on the coastal mud flats. There is also an inland flight in the

fall made up predominantly of young birds that show more preference for wet and muddy areas about marshy places. During most of the year the food is largely insects and other small forms of animal life, but in the North these plovers also eat quantities of fruits like the abundant crowberry.

VOICE: The many calls are harsher than the black-bellied's, more killdeer-like, and usually with a chucklelike roll. The commonest is of two syllables, the first ending with a quaver, the second falling in pitch. It is sometimes rendered as *quee-e-e-e-a*. Other variations are a short *que* and longer calls like *quee-del-eee*.

NEST: (P.) A slight depression, usually in reindeer moss, with a lining of moss and other lichens. The usual site is a ridge top in open tundra. The 4 buffy eggs (1.9 x 1.3) are boldly and heavily marked with brownish-black.

RANGE: (M.) Breeds from Devon and Melville islands, n. Alaska, and all n. Siberia south to the southern limit of the tundra, reaching n. Manitoba, the c. Alaska coast, and Kamchatka. Winters on the plains of s. South America from Bolivia to e. Argentina and in e. India, s. China, Australia, and the islands of the Pacific south to New Zealand. The main migration moves north up the Mississippi Valley region in spring and southeast off the Atlantic coast from Nova Scotia to n.e. South America in fall, large flights passing over Bermuda and Barbados at times.

Black-bellied Plover*
(Grey Plover)

Squatarola squatarola—~~3~~31
L. 11½; W. 23; Wt. 8 oz.

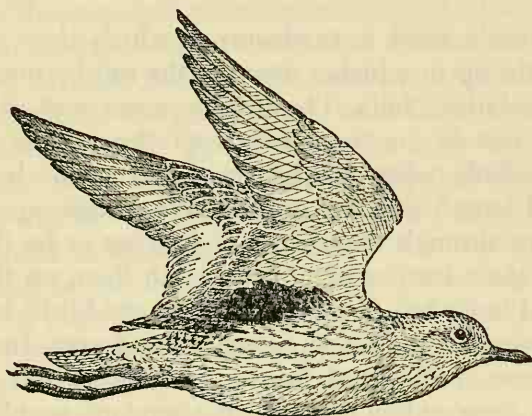
IDENTIFICATION: The light grayish back and largely white head and belly are distinctive. Most fall birds are all gray, paler below, with streaked, rather finely barred flanks as in the golden. Juveniles are spotted with yellow above, especially on the rump, but this generally fades to gray in the fall. In any plumage the black axillars, white rump, black-barred white tail, and white line in the wing are conspicuous.

HABITS: This wild, wary bird, largest of our plovers, is stockily built, with a big head and a distinctive, erect carriage. Although it has an extensive breeding range in the North, it is widely scattered and seldom abundant; in migration it never travels in vast flocks as did the once far more abundant golden plover. Black-bellies come south in small numbers clear across the country, but the largest concentrations occur on coastal tide flats, sand bars, and salt-marsh meadows, where

the birds are likely to be seen with knots, their commonest associates. Inland they prefer lake shores, mud flats, and marshy pastures but are also found at times on freshly plowed land and rain-flooded fields. They take whatever forms of small animal life are most accessible, including crabs and other crustacea, small mollusks, worms, and insects.

VOICE: The calls are rich, melodious, and somewhat plaintive whistles, the commonest a series of 3 notes, a drawled *pee-u-wee*. It is easy to imitate, and the birds decoy to it readily.

NEST: (I. 23, P.) A slight hollow in the ground or tundra moss, lined with lichens or grass. It is usually on a ridge and often on the edge of a river bluff, where it commands a good view. The 4 eggs (2.1 x 1.4) vary from pale buff or grayish to greenish or pinkish, lightly spotted with blackish.



RANGE: (M.) Breeds in the Arctic on the islands off and around the coasts of the Arctic Ocean from w. Greenland west to Siberia and the Kanin Peninsula of Russia and south in North America to Southampton Island and the Yukon delta. Winters from North Carolina, the Gulf Coast, and s. British Columbia south to Brazil and n. Chile and from the Mediterranean and India to South Africa and Australia.

SNIFE and SANDPIPERS

Family Scolopacidae

American Woodcock*

Philohela minor—#33
L. 11; W. 18; Wt. 6 oz.

IDENTIFICATION: A big, heavy-bodied, rich brown bird with broad, rounded wings and a very short neck and tail. Seldom

seen until it suddenly zigzags off from underfoot with a twittering whistle.

HABITS: Although the woodcock is not uncommon few people are familiar with it except those who have sought it out. During the day the birds remain on the ground in moist alder thickets, spring-fed hillside runs, or rich, moist bottom land, where their protective coloring renders them practically invisible. The spectacular spring courtship flights in which the male spirals up to a considerable height, circles a few times, and then descends in a series of abrupt side-slips and sudden upswoops seldom begin until half an hour after sunset. They continue until dark, or off and on all night if the moon is out. In the morning the song is given during about the same period of light intensity, the time varying with season and weather.

Their staple food is earthworms, which they can extract from depths up to 3 inches down in the soil by means of their highly specialized bills. The flexible outer end of the upper mandible can be moved away from the end of the ridged lower mandible when the bill is closed at the base and inserted full length into the ground. Woodcocks apparently locate worms through their sense of hearing or by the sense of feeling in their feet, as they often catch them on the first try. The round holes left in damp earth by the birds' bill serve as excellent signs of the birds' presence in an area. Insect larvae, chiefly those of flies and beetles, are taken, but woodcocks never stay long unless there is an abundant supply of earthworms. Of these they can eat more than their own weight in a 24-hour period. Occasionally seeds, berries, and tender leaves are added to the diet.

There is no real pairing, as each sex has its own territory and males may mate with females from more than one adjacent area. The male's territory must include a small, flat, open space grown up to grass, weeds, or brush for use when he is singing, and a patch of moist, second-growth woodland for feeding and daytime roosting. The female prefers a rather open stand of young trees near a boggy feeding place. Young birds grow rapidly and are able to fly a little when they are 2 weeks old. They are practically full grown when they are 25 days old. When they are too small to fly the female is said to be able to carry them on flights, one at a time, by holding them between her legs or pressing them against her body with her legs. In fall woodcocks often do not migrate until they have to, and many winter as far north as they can find

unfrozen ground. In spring they press north as soon as the ground thaws. Migration takes place at night, and the birds seem to travel as individuals, not as part of a flock, as is the case with most shore birds. They often fly close to the ground, and many are killed by hitting wires or other obstructions.

The clear cutting and burning of the woodlands of eastern North America by the early settlers created a great deal of woodcock habitat where the land was not cultivated but allowed to grow up again to trees. Fire, in destroying the very acid, humus layer on top of the soil made conditions much more favorable for earthworms and encouraged the growth of deciduous birches, alders, and aspens in place of the original stand of conifers. In addition, widely scattered small ownerships, divergent practices on adjacent tracts, and, within recent years, the increased abandonment of agricultural land have created an interspersion of cover that is ideal for woodcocks.

As most of these not-too-wise land-use practices have continued right up to the present day, we still have an abundance of woodcock habitat. It seems likely, however, that under the pressure of an increasing human population our land-use practices will be radically altered in the near future. The abandonment of agricultural land will soon have to stop and our woodlands will no longer be periodically degraded to the birch-aspen stage by clear cutting and fire. Instead the forest continuity will remain relatively undisturbed except for the occasional harvesting of a few of the more mature trees. How much woodcock habitat will still remain under such conditions is questionable. Very possibly the woodcock's days as a game bird are numbered.

VOICE: Between its courtship flights, at about 2-second intervals, the woodcock utters an explosive, harsh, nasal sound not unlike a nighthawk's *peent* call. It is always preceded by a much weaker, muffled, gurgling, coo-like *took-oo*, which is sometimes given alone. As the bird starts up in the air it produces short whistled notes which, as they get faster and faster, become a shrill twitter; some ornithologists believe that these are made, at least in part, by the curiously narrowed outer primaries. At the peak of its ascent and as it zigzags back to earth, the bird utters groups of clear, melodious chipping notes that so fill the air that they seem to come from all directions.

NEST: (I. 21, P.) A sparsely lined depression in the ground, commonly near a moist thicket but often in the open, in a young, not too dense second growth of mixed hardwoods

and conifers, or in brushy cover. Occasionally in open brushland or weedy fields. The 4 eggs (1.5 x 1.1) are buffy with a light sprinkling of small brown spots.

RANGE: (P. M.) Breeds from s. Newfoundland, s. Quebec, n. Michigan, and s.e. Manitoba south to c. Florida and e. Texas and west to w. Missouri. Winters from s. New Jersey, the Ohio Valley, and s. Missouri south to c. Florida and s.e. Texas.

Common Snipe*
(Wilson's Snipe)

Capella gallinago—~~33~~
L. 11¼; W. 15; Wt. 4 oz.

IDENTIFICATION: The strongly striped head and back, the whitish belly, and the long bill are diagnostic. In flight the bird has long pointed wings and a short, conspicuous orange tail. Young are like adults but rustier about the head, neck, and breast.

HABITS: The hardy and once abundant snipe is a bird of tussock-filled wet meadows, grassy marshes, and bogs. Its protective coloration and its habit of "freezing" until it is almost stepped on makes it hard to see on the ground. When flushed it zigzags off with startling suddenness. Snipe come north as soon as the ground thaws, migrating at night, apparently in small flocks, and scattering widely during the day to feed. Closely grazed wet pastures with shallow, temporary rain pools in low spots or in the hoofprints of cattle attract them as do hog wallows. They also feed on burnt-over, mowed, or plowed wet land and in the more normal shore-bird habitat of high salt marsh and the grassy edges of lakes, ponds, and ditches.

Insects, chiefly those with aquatic larval stages, supply about half their food. Small crustacea, earthworms, and snails are also important, and at times seeds of marsh plants. Snipe do most of their feeding early or late in the day and seem more active on cloudy days. It is at these times that their unusual flight song is most often heard. This is produced as the bird circles high in the air and takes sudden swoops that cause either its wings or its narrow outer tail feathers to vibrate and produce a noise not unlike the whistle of a duck's wings.

VOICE: When flushed snipe give one or more distinctive, abrupt, rasping notes that identify it at once. On the breeding ground it scolds intruders with a loud, whistled *wheat, wheat* repeated a number of times. During courtship flights it produces a high-pitched, pulsating hum or whistle with its

feathers. This carries a long distance; usually the source is hard to locate and the whole effect is rather eerie.

NEST: (I. 20, P.) A shallow depression lined with grass in the center of a sedge tussock or fern clump in a boggy marsh or under a small shrub on the edge of a marsh. The 4 eggs (1.5 x 1.1) are pale brown, boldly blotched with dark brown.

RANGE: (P. M.) Breeds throughout much of Europe, Asia, and North America from Newfoundland, Ungava, n. Manitoba, n. Mackenzie, and n.c. Alaska south to c. New England, n.w. Pennsylvania, n. Indiana, e. South Dakota, s. Colorado, and s. California. Winters from s. Virginia, Arkansas, s. New Mexico, and s. British Columbia south to s. Brazil and Colombia. A regular migrant in Bermuda.

Long-billed Curlew*

Numenius americanus—~~34~~ 34
L. 23; W. 38; B. 2.3-3; Wt. 2 lbs.

IDENTIFICATION: Bill length is not always a reliable character, but the unstriped head, large size, warm brown body color, and the clear pinkish-cinnamon of the wings are diagnostic.

HABITS: This splendid species, which once bred abundantly throughout the western grasslands as far east as the prairies of Illinois, was often common on the coasts of Massachusetts in migration. Now the birds are restricted to the plains region, nesting usually near moist, low meadows and in the more luxuriant grass of river-valley slopes. When migrating they also frequent lake shores, river bars, and seacoast salt marshes, mud flats, and sandy beaches. Insects, especially grasshoppers, locusts, and crickets, are staple foods, but crayfish, crabs, mollusks, and, at times, berries are also taken. When not nesting they generally gather into roosts at night but scatter out during the day in twos or threes to feed. They migrate, however, in large, often noisy, V-shaped flocks. A whistle will decoy them, and their habit of returning again and again to a wounded member of the flock enabled hunters to slaughter them in great numbers in the days when they were classified as game birds.

VOICE: The loud calls are mostly clear and melodious, usually of 1 or 2 notes but sometimes prolonged into a roll or rattle. The notes suggest at times those of the upland plover, the willet, and the rally call of the bobwhite.

NEST: (P.) A slight hollow in the ground in an open grassland, lined with grass. The 4 eggs (2.6 x 1.8) are olive-buff, evenly spotted with brown.

RANGE: (M.) Breeds from Manitoba and e. British Columbia south to w. Kansas, n. New Mexico, and n.e. California. Winters from South Carolina (once abundant, now rare), the Gulf Coast, s. Arizona, and c. California south to the West Indies and Guatemala.

Whimbrel*

Numenius phaeopus—~~34~~

(Hudsonian Curlew)

L. 17; W. 32; B. $2\frac{3}{4}$ –4 ($1\frac{1}{2}$ in some young birds)

IDENTIFICATION: The downcurved bill identifies a curlew. This bird has a striped head and is grayish-brown in body color.

HABITS: Originally this curlew was not as abundant in North America as the long-billed or the Eskimo, with which many early American ornithologists confused it. Today it is relatively common along our coasts and is apparently increasing. It seems possible that the 3 curlews occupied similar enough niches, at least at certain seasons, for the abundance of the other 2 to have held down the population of the whimbrel until, with the coming of the white man, its greater wildness gave it an advantage. Although whimbrels breed in open tundra, the present nesting grounds are concentrated in certain relatively restricted areas. The birds seem to prefer coastal areas near fresh water and often near the scattered stands of small trees that occur in favorable spots along the southern edge of the Barren Grounds. In migration they travel in long lines and V's, calling with 4 short whistles and often sailing for short periods on set wings. Inland they are rare, occurring usually in flooded fields, on the edges of shallow lakes, and on river bars. Their main flights are coastal and apparently offshore for long stretches, as these curlews occur regularly in Bermuda in the fall and are abundant at certain points along the coast, though scarce at others. They feed in mud flats, high salt marshes and coastal beaches, gathering at night into large roosts on isolated marsh islands or sand bars. Their food varies from fiddler crabs and other crustacea, mollusks, and worms to insects and such fruits as the common crowberry of the Arctic.

VOICE: When flushed, a series of loud, rather harsh, whistled *pip, pip, pip* notes. When calling to one another, sweet, liquid, tremulous notes, often in a long rolling series.

NEST: (P.) In a depression in the ground or in a clump of moss or sedge on open tundra. The 4 eggs (2.3×1.6) are olive-buff to green, heavily marked with brown.

RANGE: (M.) Breeds locally throughout the northern part of the Northern Hemisphere; in North America from s. Greenland, Southampton Island, and the w. shore of Hudson Bay and n. Mackenzie to w. Alaska south to Fort Churchill, Mount McKinley, and the mouth of the Yukon; in Eurasia south to n. Scotland and c. Russia. The main wintering grounds appear to be from British Guiana to the mouth of the Amazon and from Lower California to s. Chile. Since there are always some individuals that fail to complete the migration, the species is often present the year round along its migration routes. Abroad it winters south to s. Africa, Tasmania, and the islands of the South Pacific.

Eskimo Curlew*

Numenius borealis—~~34~~

L. 13½; W. 28; B. 2-2½; Wt. 1 lb.

IDENTIFICATION: This bird is so hard to separate in the field from the whimbrel that sight records are always open to question, yet it is so rare that a record is not worth the sacrifice of a single individual. The only absolutely diagnostic point of difference is the unbarred primaries. This species has generally a shorter, slenderer, straighter bill, a much smaller body, and is more buffy-brown in color, often quite blackish above with stronger contrast between upper and under parts. As a rule the dark crown shows no clear-cut light median stripe and the underwing is darker, more of a reddish-brown instead of pinkish-buff.

HABITS: The shooting of this bird in the fall on the North Atlantic coast, on the Pampas of Argentina, and from Texas to the Prairie Provinces of Canada in the spring changed the status of the Eskimo curlew from one of fabulous abundance to one of dismaying scarcity during the period from 1870 to 1890. The birds' lack of suspicion and fear and their extreme gregariousness made them especially vulnerable to hunters, and in spring, when they gathered in vast flocks on freshly burned prairie and newly plowed fields to feed on insects, they were shot, often by the wagonload, and shipped to market in New York and Boston. In fall they fed largely on crowberries and other fruit and became very fat before making their long ocean flight. It was only when storms diverted them from their route that they appeared in numbers along the coast south of Nova Scotia. Undoubtedly a few of the birds survive, as there continue to be sight records. A specimen was shot in Labrador in 1932. Probably the best place to

look for them is with flocks of golden plover, Hudsonian godwit, or whimbrel, as their extreme gregariousness should draw them into association with flocks of the more abundant species. Every record of this rare bird is worth publishing.

VOICE: In flight the members of a flock utter soft, melodious, and rather tremulous whistles suggesting those of a bluebird. Often these notes are so constant that the flock produces a twittery sort of chatter that carries a long distance. A thin squeak like one note of the common tern, as well as soft, Bartramian sandpiper-like whistles have been noted.

NEST: (P.) Out in open tundra in a depression in the ground. The 4 eggs (2.0 x 1.4) are brown to olive, spotted and blotched with dark browns.

RANGE: (M.) Apparently bred on the Barren Grounds of n. Mackenzie west into Alaska and wintered in Chile and Argentina south to Patagonia. The main migration route south lay across the ocean from the Newfoundland area to Brazil and came north across the Great Plains in spring, roughly parallel-ing that of the golden plover and Hudsonian godwit.

Upland Plover*

(Bartramian Sandpiper)

Bartramia longicauda—~~35~~ 35

L. 12; W. 22; Wt. 7 oz.

IDENTIFICATION: The short, slender bill; small head and slender neck; very dark rump; large, white-bordered, finely black-barred, pinkish-buff tail, and strongly black-and-white underwing area are helpful aids to identification. Young are similar but darker-backed, more strongly buffy, and less streaked on neck and breast. Once learned, its calls will identify the bird, even when it is passing overhead at night during migration.

HABITS: On its nesting grounds this sandpiper often flies with a slight flutter of the tips of its stiffly held, downcurved wings after the fashion of a spotted sandpiper. Its normal flight, however, is very buoyant and swift, as its long pointed wings and tail are large for its weight. The "quailie," as it is often designated because of its call, inhabits open grassy areas ranging from sandy, sparsely vegetated flats to open grassy bogs, but it is most often found in rich pastureland and hayfields. Although originally a bird of western prairies and plains, it became common through the entire Northeast as farms replaced forest. Then, with the market hunting of the '80s and '90s, it almost vanished from both regions. Now with complete protection on its breeding grounds it is increasing, but with a breeding potential of only 4 young a year, a long

and hazardous migration route, and a hunting toll on its wintering grounds, its recovery will be slow. How foolish it now seems to have permitted these almost wholly insectivorous birds to be shot off to supply a few tons of food. Not only were they an attractive, animated part of our landscape, but they and the other migrant, upland game birds must have once played an important role in checking serious outbreaks of grassland insects. Even today they concentrate in areas where grasshoppers, crickets, and weevils are most abundant. Fortunately, the upland plover continues to show itself adaptable, as at times it feeds and nests in open croplands as well as in alfalfa fields and has recently adopted airports as regular feeding grounds and stopping places during migration.

VOICE: The various calls of this sandpiper are among the most beautiful sounds in nature—some infinitely rich, mellow, and liquid; others strangely windlike and mournful. The alarm note is a rapid *quip-ip-ip-ip*, but as the bird flies about it utters a rich, rolling trill. The 2-part song, often given from high in the air, carries for great distances. It starts as a rapid, almost tree-toad-like trill which, after rising in pitch, changes to a clear, mournful whistle that swells and fades in volume.

NEST: (I. 21., P.) A hollow in the ground, lined with a little grass, sometimes in the open but generally hidden in a tuft of grass or a small clump of brush. The 4 eggs (1.8 x 1.3) are pinkish- to greenish-buff, evenly covered with small brown spots.

RANGE: (M.) Breeds from c. Maine, s. Ontario, c. Wisconsin, s. Mackenzie, and n.w. Alaska south to Virginia, s. Illinois, s. Oklahoma, n.e. Utah, and s. Oregon. Winters from s. Brazil to c. Argentina.

Spotted Sandpiper*

Actitis macularia—~~37~~ 37
L. 7½; W. 13½; Wt. 1½ oz.

IDENTIFICATION: Summer adults with their round, black spots are unique. In fall adults and young are similar and can best be told by their olive-brown backs, the white stripes through and along the rear edge of the inner wing, the narrow, blackish-white border to the dark tail, and the pale base of the lower mandible. Sometimes the folded wing does not fully cover the white side, which shows as a conspicuous white spot just above the bend of the wing.

HABITS: The spotted is more uniformly distributed across the country than any other sandpiper. There is hardly a body of

fresh water, running or still, in open country from sea level to mountain timber line that may not harbor a breeding pair of "teeter-tails." Sometimes the nest is only a few feet from water but more often is at some distance away in a grassy field, wasteland, or cultivated area. Rocky as well as muddy or sandy shores are frequented, and the birds reach their greatest concentration on especially favorable islands where, despite their normally unsociable nature, they sometimes form loose colonies. They seem to avoid the seacoast in some regions, but in New England they nest on coastal islands and along beaches, where they show special fondness for pebbly shingles. All manner of small animals are acceptable as food, from crustacea and small fish to grasshoppers and other upland insects.

The "spottie's" habits of constantly waving its tail up and down and of fluttering off across the water on vibrating, stiffly held downcurved wings for only a short distance before returning to the shore are distinctive. The birds are so inconspicuous that often the first indication of their presence is their loud *peet-weet* call. They like to walk up and down logs or rocks near water, teetering all the while. Unlike most shore birds, they can perch on small twigs or wires. Not only do the precocial young swim well, but the adults readily take to the water to escape danger and swim under water with half-extended wings or walk on the bottom like dippers.

VOICE: When flushed or disturbed, a series of *peet-weet* calls or a long run of *weet* notes. A soft, low, rolling call to the young and a single loud, intermittent whistle not unlike a spring peeper's are heard in summer.

NEST: (I. 21, P.) A depression in the ground, sparsely lined with grass, or, in more northern areas, a deep cup of moss, seaweed, and grasses. The site may be in the open, well hidden in a dense bed of vegetation, or under a bush, log, rock, or bank. The 4 buffy eggs (1.3 x .91) are spotted and heavily blotched with browns.

RANGE: (P. M.) Breeds from Newfoundland, n. Ungava, n. Manitoba, n. Mackenzie, and n.w. Alaska south to South Carolina, c. Alabama, s. Louisiana, c. Texas, s. New Mexico, and s. California. Winters from Bermuda, South Carolina, the Gulf States, and s. British Columbia south to s. Brazil, Bolivia, and c. Peru.

Solitary Sandpiper*

Tringa solitaria—~~35~~
L. 8½; W. 16; Wt. 1¾ oz.

IDENTIFICATION: The tail, which is conspicuously white with dark bars, except for 2 dark center feathers, and the uniformly dark wings and upper parts are distinctive. Young birds in summer are paler, more olive-colored above, thickly spotted with white or buff, and grayer on the head and neck.

HABITS: During migration this dainty, graceful bird occurs singly or in small groups about all sorts of fresh-water areas. Secluded woodland streams, ponds, bogs, and stagnant rain pools are favorite haunts, but it also frequents pasture ponds and even stagnant barnyard mud puddles as well as lake and river edges. Few nests or downy young have ever been found, but it is believed that the solitary generally nests about the ponds, bogs, and swamp-like borders of the northern coniferous woodlands. Its habit of starting its southward migration in early July has probably been responsible for some of the reports of its breeding farther south. The birds are easily approached as they wade about in the shallow water, bobbing their heads from time to time. When flushed they fly off with deep strokes of their dark pointed wings, which are momentarily held extended over the back after the bird alights. The flight is buoyant but often erratic—quite unlike a spotted sandpiper's. Little is known about their food, which must be largely crustacea and aquatic insects.

VOICE: When flushed, a series of *weep* notes similar to a spot-tie's, but more abrupt, higher-pitched, and thinner. Also shorter *pit* or *pip* notes, singly or in a series.

NEST: (P.) The 4 eggs (1.4 x 1.0) are laid in the old nest of such birds as the robin, grackle, or rusty blackbird from 4 to 20 feet above ground. They are pale green or creamy-buff, thickly spotted and blotched with purplish-grays and brown.

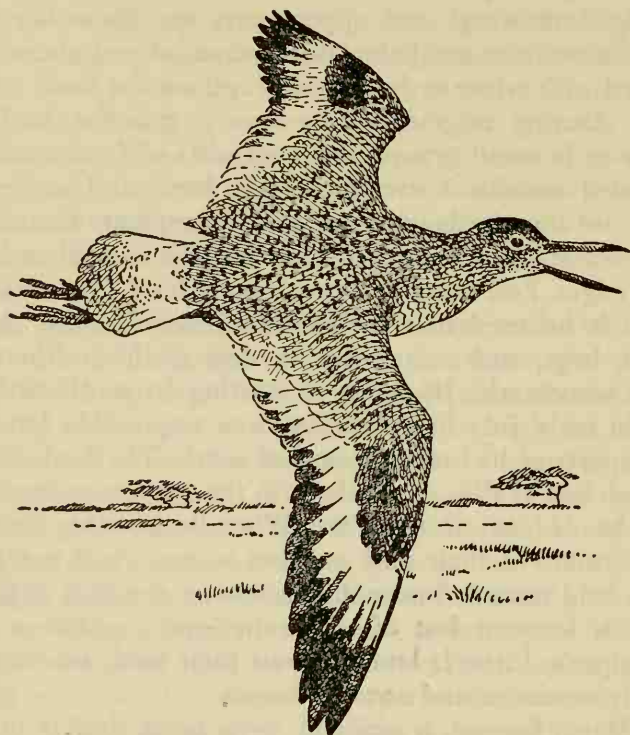
RANGE: (M.) Probably breeds from Newfoundland, n. Ungava, n. Manitoba, n. Mackenzie, and c. Alaska south to about the northern border of the United States. Winters from the West Indies and s. Mexico south to Argentina. There is an offshore as well as inland migration, as it is regular in Bermuda.

Willet*

Catoptrophorus semipalmatus—~~35~~
L. 15; W. 27; Wt. 8 oz.

IDENTIFICATION: The bold black-and-white wing pattern created by the white bases of the primaries and almost wholly white

secondaries and tail is distinctive. On the ground it is a heavy, rather uniformly colored grayish bird with bluish legs and a heavy bill. Fall adults and young are paler and largely unstreaked.



HABITS: East of the Mississippi the willet breeds only on the coastal salt marshes and beaches, but in the West it is exclusively an inland breeder, widely scattered about the lakes and sloughs of the open grasslands. Only small remnants survived the shore-bird shooting days of the past, but within recent years it has become locally abundant in some areas. From these it seems to be slowly spreading back into its former haunts as population pressures force the young outside the limits of their natal region. This is so slow a process that some ornithologists have suggested speeding it up by transferring eggs or newly hatched and as yet unoriented young to suitable refuge areas within the bird's original range.

In fall there is a marked east and west migration that carries western willets to the Pacific and to the Atlantic coast as far north as New England. Nova Scotia birds seldom appear in the New England area in fall and only occasionally in

spring, which must mean that their migrations are largely across the ocean to the West Indies or South America. Willets sometimes feed on sandy beaches but seem to prefer the shallows and mud flats of marshes, where they eat small mollusks, fiddler and other crabs, crayfish, small fish, insects, and other small animals.

VOICE: The loud, clamorous cries are highly varied. The most common is a series of *wee wee wee wee* notes. The song is a more musical *pill-o-will-o-willet*.

NEST: (P.) Along the seacoast the nests are on the upper beaches and dune edges, in brushy or open land adjacent to the inland edge of the salt marsh, on ditchbanks and other high spots in the marsh itself. In the West the birds nest on prairies or alkaline flats about shallow, marshy lakes. The nests are either on the open ground or hidden in a clump of grass or under a bush and vary from slightly lined depressions to bulky cups of grass and weeds. The 4 eggs (2.1×1.5) are olive-buff, spotted and blotched with browns.

RANGE: (M.) Breeds in Nova Scotia and from s. New Jersey to Florida, the n. West Indies, and Texas; also from s. Manitoba, s. Alberta, and c. Oregon south to n. Iowa, c. Colorado, and n.e. California. Winters from North Carolina, the Gulf Coast, and n. California south to Brazil and Peru.

Greater Yellowlegs* *Totanus melanoleucus*—#35
(Greater Yellowshank) L. 14; W. 25; B. 2-2.3; Wt. 7 oz.

IDENTIFICATION: The bright leg color of a yellowleg is diagnostic. In flight the bird shows a dark back and wings and a largely white rump and tail. This larger species has a proportionately longer neck and legs; a longer, heavier, slightly upturned-appearing bill; distinctive call notes; and often seems to have more orange-yellow legs and darker, more strongly marked upper parts than the lesser yellowlegs.

HABITS: The big yellowlegs is an alert, wary, and very noisy bird that prefers to feed in shallow water, often wading in up to its breast and occasionally even swimming. Little is known about its summer haunts in the muskeg and marshes of the northern forest. Few nests have been found. It is an early migrant both in spring and fall and occurs more or less regularly in nearly every area suitable for shore birds in the Western Hemisphere, except the Arctic. In fall, when some birds use a transoceanic route, the species is often less common in the interior. Although flying high, passing flocks are

readily identified by their long legs and frequent calls, to an imitation of which they readily decoy. The "tattler" or "telltale," as hunters call it because of its habit of sounding an alarm at their approach, frequents rain pools in fields as well as shallows along the shores of ponds and sluggish streams. On the coast it prefers the small pools of the high salt marsh and half-covered tidal flats to the ocean beach. When feeding the birds seldom probe in the mud but run here and there in shallow water chasing fish, tadpoles, and the various crustacea and aquatic insects that are their main foods.

VOICE: A loud, clear, forceful *whew*, most frequently uttered in groups of 3 or 4 but occasionally as a double note or series of single notes. Also a rolling, yodel-like, rapid series of mellow, rather musical notes.

NEST: (P.) A depression or scrape in the ground on a hummock in or near a wet, boggy stretch of open tundra or marsh or on a low, timbered ridge in muskeg country. The 4 eggs (1.9 x 1.3) are orange-brown, heavily and boldly marked with reddish-browns.

RANGE: (M.) Breeds sporadically from Labrador, s. Ungava, s. Mackenzie, and s. Alaska south to Newfoundland, s. Manitoba, and s. British Columbia. Winters from South Carolina, the Gulf Coast, s. Arizona, and c. California through the West Indies, Mexico, and all Central and South America to the Strait of Magellan.

Lesser Yellowlegs*

(Lesser Yellowshank)

Totanus flavipes—#35
L. 10½; W. 20; Wt. 3 oz.

IDENTIFICATION: The marked size difference between the otherwise almost identical yellowlegs is of little value in identification unless a direct comparison can be made with other nearby shore birds whose size is known. The lesser is a more delicate and compactly built bird with a finer, shorter bill; shorter neck and legs, the latter usually appearing more lemon-yellow; and upper parts that often appear to be a softer, lighter, more uniform gray.

HABITS: As a breeder this bird stays south of the treeless tundra, preferring the grassy meadows and bogs between the thin strands of timber. In the more heavily wooded areas farther south it seems to benefit from forest fires, as it avoids densely timbered areas and nests quite commonly in burnt-over forest and in the open poplar-aspen stands that follow fire. The spring migration is largely inland, but in fall the birds are

also common on the coasts. Some of them must fly south over the ocean to South America, as in fall they occur quite regularly in Bermuda and Barbados. These "summer yellowlegs" come north later and go south earlier than the greater, or "winter yellowlegs." Both species feed in shallow water, rain pools, wet grassy areas, and brackish salt-marsh ponds, picking their prey out of the water or from the surface rather than probing for it. The normal diet consists largely of crustacea and insects, including land forms which inhabit grassy areas and mowed fields. The lesser seems a bit more gregarious and more inclined to flock up than the greater, and though the birds scatter out for feeding, they are often associated with other shore birds. Both species are active feeders that chase prey through the water, and both have the curious habit of abruptly raising and lowering the head as they pause to look around.

VOICE: The common call is a single or double *wheu*, softer and more nasal, as a rule, than the greater's. It has a yodeling roll similar to the greater's, and the members of a flock use a variety of soft, conversational notes.

NEST: (P.) In a depression in the ground on a slope, ridge, or high ground, often quite far from a pond or boggy marshland, and more or less in the open or in a burnt-over, thinly wooded area. The 4 eggs (1.7 x 1.1) are buffy, blotched with browns.

RANGE: (M.) Breeds from n. Ungava, n. Manitoba, n. Mackenzie, and n.c. Alaska south to c. Quebec, s. Manitoba, and n. British Columbia. Winters from Florida, the Gulf Coast, and Mexico south to the Strait of Magellan.

Knot*

Calidris canutus—~~33~~ 33
L. 10½; W. 20½; Wt. 5 oz.

IDENTIFICATION: There is no other short-billed shore bird with a brick-red breast in spring. In fall its large size (nearly that of a black-bellied plover), short legs, and stocky build are good clues. In flight it shows a narrow white line in the wing and a pale grayish rump and tail.

HABITS: Some individuals of this sturdy species probably make an annual trip of some 19,000 miles from the most northern to virtually the most southern land in the Western Hemisphere. Although in the Arctic it nests inland and feeds about the fresh-water marshes of the tundra, the knot is largely a bird of the immediate seacoast and a rare migrant in the

interior. "Robin snipe" are very gregarious, feeding and flying in densely massed flocks which change color in spectacular fashion as they wheel in the air in perfect unison, showing gray backs one moment and red breasts the next. Sandy beaches and, to a lesser extent, sandy flats, especially near inlets, are favorite feeding grounds. Here the birds pick food from the surface after the manner of the black-bellied plover, which is generally their commonest associate, though they are also frequently seen with turnstones. Pebbly shores and eroding outcrops of marsh deposits attract them, and on rocky coasts they feed on seaweed-covered rocks at low tide. Year after year they return in migration to certain favored spots where they may be abundant although seldom seen a few miles away. The knot's principal food is small snails and clamlike mollusks, plus insects, crustacea, and the seeds of marsh plants like widgeon grass.

VOICE: A very low-pitched, hoarse, single *knut* note, variously described as a honk, croak, or grunt; also a low, double, whistled *wah-quoit*, ending in a slight roll.

NEST: (P.) A hollow in the ground, often lined with lichens and placed among the rocks and sparse vegetation of ridges and hills, often well above and away from feeding grounds. The 4 eggs (1.7 x 1.2) are olive-buff, spotted and blotched with brown.

RANGE: (M.) Breeds in n. Greenland, the Taimyr Peninsula, and many of the islands of the Arctic Ocean south to the Melville Peninsula and Victoria Island. Winters from Buenos Aires to Tierra del Fuego on the east coast and south to Peru on the west coast of South America; also to the Mediterranean and Black Sea region, w. Africa, Australia, and New Zealand.

Purple Sandpiper*

Erolia maritima—~~3~~31
L. 9; W. 15; Wt. 3 oz.

IDENTIFICATION: This short-legged, rotund rock dweller is the darkest of our sandpipers and has yellowish legs and bill.

HABITS: Outside the breeding season this bird occupies a highly specialized niche and is seldom seen away from seaweed-covered offshore rocks. Occasionally a weedy reef or a fresh deposit of sea wrack along an upper beach holds a wandering individual for a time, but this is rare. Until the coming of civilization purple sandpiper habitat was virtually non-existent south of n. Massachusetts. Now with the building of many

long stone jetties and breakwaters up and down the coast the bird is extending its winter range.

At low tide these sandpipers are almost invisible from shore except as they momentarily flutter into the air to avoid a wave and so reveal their white bellies and wing linings. At high tide, when they are forced up to the tops of bare rocks, they are more conspicuous. Purples are quite gregarious and, although they scatter to feed, they usually flush as a group. They seldom fly far but curve back to land in the manner of, and often with a flight that suggests that of, the spotted sandpiper. Little is known about their food, which seems to be largely small mollusks and crustacea. Inland in the Far North during the breeding season they sometimes eat buds and leaves.

VOICE: A low, swallowlike single or double *twit*. Also high-pitched, twittery trills.

NEST: (P.) A hollow in the ground, well lined with grass and leaves, on a barren hillside or mountaintop, often far from the sea, but in the Far North in tundra not far from shore. The 4 eggs (1.5 x 1.0) are light green or buff, spotted and blotched with brown.

RANGE: (P. M.) Breeds from Melville Island, n. Greenland, Spitsbergen and the Taimyr Peninsula south to Southampton Island, Iceland, and n. Scandinavia. Winters from s. Greenland to New England and casually south to South Carolina; also to Great Britain and the Baltic coasts.

Pectoral Sandpiper*

Erolia melanotos—~~37~~ 37
L. 9; W. 17; Wt. 2 oz.

IDENTIFICATION: The dark crown; a longer neck than that of other small sandpipers; a rather dark, reddish-brown back with fine light stripes; a sharp line of separation between the dark, buffy upper breast and the white under parts; and the greenish-yellow legs are distinctive. In flight the wings lack a white stripe and the tail is pale gray-brown except for the dark center feathers. Unlike so many sandpipers, this species commonly carries its neck well extended with the head high.

HABITS: This bird is well termed "grass snipe," as wet meadows, rain pools in grasslands, and even fairly dry, rough pastures are its favorite haunts. Along the coast dense beds of salt hay (black rush) back in the farthest reaches of the salt marsh next to the upland are its chief feeding grounds. Pectorals seem to prefer short grass, and mowing always im-

proves an area's attractiveness for them. The small flocks of 10 to 30 birds scatter out to feed, freezing and crouching to avoid observation, and only flushing one by one when about to be stepped on. Then they zigzag away in snipelike fashion with a few very distinctive grating notes. Grassy shores of lakes, marsh ponds, and rivers are good places to look for scattered birds. Occasionally they feed on open mud flats with other shore birds, where their habit of stopping at intervals in erect and watchful attitude, with head extended, can be observed. In flight the flocks are compact and maneuver in unison. The great difference in size between the largest females and the smallest males is quite noticeable. On the grassy tundra breeding ground the male inflates its neck and upper breast, thrusts forward its buffy pectoral pads, and, with wings askew, utters a tremulous, hollow, and yet resonant and musical song which sounds like someone blowing across the top of a bottle. Insects form a large part of the food of this species, plus worms, crustacea, and other small animals.

VOICE: When flushed, a sharp, abrupt, grating *errrik*, hoarser and more snipelike than the notes of other small shore birds. The call notes of a flock are low, rather reedy chips.

NEST: (I. 22, P.) Usually a well-made cup of grass and leaves in a depression in a dry, generally grassy area up on a ridge or on the rolling tundra upland, but occasionally in the reedy grass of a pond border. The 4 eggs (1.4 x .98) are white to buff, blotched with browns.

RANGE: (M.) Breeds in Southampton Island; along the extreme west shore of Hudson Bay and the Arctic coast and from here to n. Alaska and n.e. Siberia; south in Alaska to the n. Yukon delta. Winters from Bolivia and Peru to c. Patagonia and s.c. Chile. Migrates north between the Appalachians and the Rockies but moves south in fall across the continent from coast to coast with a marked offshore flight that regularly takes it to Bermuda and the Lesser Antilles.

White-rumped Sandpiper*
(Bonaparte's Sandpiper)

Erolia fuscicollis—~~36~~ 36
L. 7½

IDENTIFICATION: In flight the white upper tail coverts are set off by a very dark tail, but in so small a bird the contrast is often none too conspicuous. In spring the back has a striped appearance and the crown and especially the scapulars are more or less pinkish-buff. In fall the color is uniformly pale

gray with an occasional rusty feather. The streaking on the head and neck is usually fine and crisp and so extensive that no white shows in the bend of the wing as in a semipalmated. This bird is also slimmer than a semi and appears proportionately longer from legs to end of tail.

HABITS: This is a puzzling bird. Over much of Argentina it is said to be the commonest wintering shore bird, and accounts from the Arctic speak of it as occurring in tremendous numbers in migration, and in breeding areas like Southampton Island it is second only to the semipalmated sandpiper in abundance. Yet in most of the United States it is a rarity, and only in the Great Plains and on the North Atlantic coast is it seen in flocks of any size. It commonly occurs in a wide variety of shore bird habitats, from beaches and sandy river bars to pasture rain pools, wet meadows, and stubble fields, and is usually associated with other small waders, but favorite haunts are muddy shores of shallow lakes and the tidal sounds along the coast. The white-rumps' actions are inclined to be slow and deliberate. When feeding they probe deeply and repeatedly in one spot, often standing up to their bellies in water with the whole head under when feeding. They are frequently so tame that they fly only a few feet when disturbed and immediately go back to feeding.

VOICE: The squeaky call when flushed is so distinctive that it at once reveals the presence of a white-rump in a flock of "peep" (small sandpipers). The call is an abrupt, sharp *tzeet* that sounds batlike or like the click of 2 marbles struck together. The twitter of a spring flock is quite swallowlike.

NEST: (P.) A thinly lined depression on a dry rise or hummock in a low, grassy swale or near a lake or pond. The 4 eggs (1.3 x .95) are olive-green with a few heavy brown blotches.

RANGE: (M.) Breeds from s. Baffin Island and the s. Arctic Islands west along the coast to n.e. Alaska. Winters from Paraguay south to the Strait of Magellan and the Falkland Islands. The migration route is east of the Rockies and in fall is partly, if not largely, transoceanic, as the birds occur regularly in Bermuda.

Baird's Sandpiper*

Erolia bairdi—~~36~~
L. 7½; W. 16

IDENTIFICATION: The bright clay-colored appearance is distinctive. The sides of the head and neck, and the breast especially, are very buffy. The back feathers, particularly in

young, are so broadly edged with light buffy that the birds have a scaled appearance. The legs are brownish- or greenish-black and rather short. The comparatively short, slender bill and the dark primaries, which extend an inch or more beyond the tertials, give the bird a long slim look. In flight it shows a broad, indistinct white line through the wing.

HABITS: This nondescript little bird is usually found in association with other "peep." Although it flies in the same flock with others, it leaves them upon landing and feeds by itself, alternately running and abruptly stopping as it picks up food from the mud. It does not like to probe in shallow water or very wet mud, and even on the beach it stays along the upper edge of the wave-washed area. The damp ground along the inside edge of coastal ponds back of the beach and the sparse or cutover marsh-grass areas are also good places to look for them. Inland they may be found far from water in grasslands, but river bars, shores of receding lakes, and irrigated or rain-soaked fields are the most common habitats. Baird's seems to be something of a mountain sandpiper. In Chile, where most of them appear to winter, they occur up to elevations of 13,000 feet, and in Colorado they have been noted about lakes at comparable elevations. Crustacea and insects seem to supply most of their food.

VOICE: A fairly loud, yet rather mellow, rolling trill similar to that of other species.

NEST: (P.) A shallow depression in moss or grass on a ridge or knoll in the tundra or well up on a rock-strewn mountain slope. The 4 eggs (1.3 x .9) are buff, ranging from pinkish to olive, with generally small brown spots.

RANGE: (M.) Breeds from Baffin Island (or Greenland) along the Arctic Islands and coast west to n.e. Siberia and south to Southampton Island, c. Mackenzie, and c.w. Alaska. Winters in Chile and s. Argentina. The main migration route is across the Great Plains. Stragglers occur from coast to coast, especially in the fall, and more commonly on the West Coast than the East.

Least Sandpiper* (American Stint)

Erolia minutilla—~~36~~
L. 6; W. 11½

IDENTIFICATION: This smallest of our sandpipers has dusky yellow legs, a thin, short bill, a fairly dark, well-streaked breast, and a distinctly brownish appearance. In flight the white wing stripe is easily noted.

HABITS: Breeding grounds are the open bogs and marshes of the northern spruce-fir forest. Courtship, however, gets under way as the birds move north, the male circling in the air on quivering wings while uttering short bursts of song—clear, tremulous trills rising in pitch and given in a sweet, minor key. Most leasts do not reach their breeding grounds until late May, yet early July sees small flocks already moving south through the northern states. On migration the birds are very tame and quite gregarious, occurring alone in small flocks or in association with other shore birds in mixed flocks. Their favorite haunts are wet or muddy areas, sparsely grown up in grass or recently cut over. When flushed they zigzag off like miniature snipe or pectoral sandpipers, of which they often seem to be a small edition. Occasionally, especially in spring, they visit sandy ocean beaches, but muddy shores of grass-fringed marsh creeks or the more open flats where glasswort grows are the best places to look for them. Inland they frequent river bars and beaches, pond and lake shores, rain pools, and, at times, dry pastures. When feeding they pick from the surface or probe in mud or shallow water, their diet being the normal shore-bird selection of insects, crustacea, worms, and small mollusks.

VOICE: When flushed the first call is a soft, slightly grating *scrēē-ēē-ēē*, followed by shorter *grēēt* calls. Also many other short notes and a little whinny.

NEST: (P.) A depression in the grass or moss of a hummock or knoll in an open marshy place or bog in the subarctic forest zone south of the open Barren Grounds. Sometimes the nest is in brushy upland near a pond or the seacoast. The 4 eggs (1.1 x .83) vary from pinkish- to greenish-buff, boldly blotched or finely spotted with browns.

RANGE: (M.) Breeds from n. Labrador, n. Manitoba, n. Mackenzie, and s.w. Alaska south to Newfoundland, n. Ontario, s. Mackenzie, and s. Alaska. Winters from North Carolina, the Gulf Coast, and s. California south to e. Brazil, Peru, and the Galápagos Islands. Well distributed from coast to coast on both migrations, some taking an offshore route in fall, when they occur regularly in Bermuda.

Curlew Sandpiper*

Erolia ferruginea—~~37~~
L. 8; W. 15½

IDENTIFICATION: The long, slim bill is a good but not diagnostic field character, as in some individuals it is identical with a

dunlin's. The white upper tail coverts are always diagnostic, and the long legs, upright carriage, slim body, and pale, indistinctly streaked, often buffy, breast are good clues. Spring birds are unmistakable.

HABITS: This Asiatic species is occasionally encountered in North America in both spring and fall, usually in association with the dunlin. It seems to share the habits of the latter and occurs both on mud flats and sand beaches. In intensively watched areas like those around New York City it is recorded with considerable regularity (*Birds around New York City*—Cruickshank).

VOICE: A soft, musical *chirrup* is the common flight call.

NEST: (P.) A depression on south-facing slopes of the tundra where snow melts first. The 4 eggs (1.4 x 1.0) are pale yellowish with blackish spots.

RANGE: (M.) Breeds on the coast and islands of n.e. Siberia. Winters in Africa, India, and Australia. There is a regular westward migration to the coast of Europe which apparently carries a few birds across the Atlantic and down the east coast of North America, through the West Indies to Patagonia.

Dunlin*

(Red-backed Sandpiper)

Erolia alpina—~~37~~ 37
L. 8½; W. 15

IDENTIFICATION: Red-backed, black-bellied breeding adults are unmistakable. In fall the long, heavy, curved bill; uniformly dull, rather dark grayish upper parts; dusky breast, and hunched-up appearance are distinctive. In flight the wings show a distinct, narrow white line.

HABITS: (Age 5 yrs.) In the United States the dunlin is a hardy, late fall migrant and winter bird. In dense flocks or associated with other shore birds, especially sanderling, dunlins frequent the ocean beaches, sandy bars and flats near inlets, or mud flats on tidal bays. Inland they occur as spring migrants on the muddy borders of rain pools in fields or on recently flooded river bottom land, and in fall on muddy bottoms of dried-up shallow ponds and lakes. They are very tame and, as a rule, rather sluggish, moving slowly and methodically as they probe and dig for food—chiefly crustacea, worms, small mollusks, and insects.

Once abundant, this little shore bird had become a rarity by the end of the nineteenth century, as it spent the better part of the year on our coasts, where it was subjected to merciless hunting. Now it is again common and still in-

creasing, but neither it nor any of our other shore birds can ever again be game birds. Their rate of reproduction is too low, their highly specialized habitat requirements concentrate them too much, and their habit of flying in dense, closely bunched flocks that return again and again to wounded members make them too vulnerable. Now that our seacoasts have become so densely settled as resorts that every part of them is easily accessible by road or boat, a single open season on shore birds could undo all that has been accomplished by many years of protection.

VOICE: An abrupt *chu* is given as the bird flushes. The flight call is a loud *purre*, melodious and often rather plaintive. The song, delivered as the bird hovers in air, is a rapid tinkling trill that drops in pitch and increases in tempo as it progresses.

NEST: (P.) On a hummock or dry knoll, usually near a pond in low, moist grass-tundra, coastal marsh, or, in Europe, in highland moors. The nest is a grass- and leaf-lined depression, well hidden under a tuft of old grass. The 4 eggs (1.4 x 1.0) are pale green to olive-buff, spotted or blotched with brown.

RANGE: (M.) Breeds around the world, south from the shores of the Arctic Ocean, in Europe to Great Britain and the Baltic countries. In North America occurs from Southampton Island to w. Alaska and south to n. Manitoba, s. Mackenzie, and the Yukon delta. Winters from New Jersey and s. British Columbia south along the coast to c. Florida, Texas, and s. Lower California. East of the Mississippi, is of regular occurrence inland, especially around the Great Lakes. Farther west, becomes increasingly rare until the Pacific coastal area is reached, where it again becomes common.

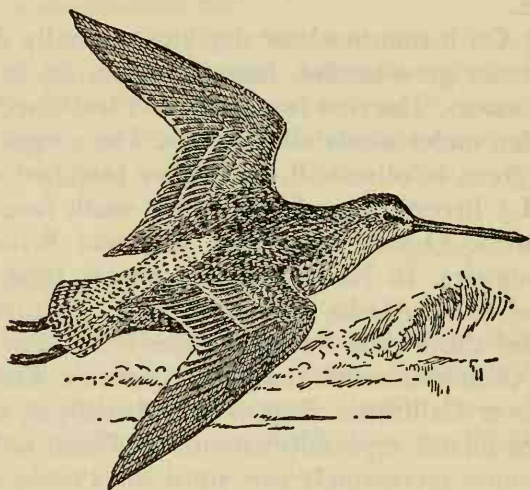
Dowitcher*

Limnodromus griseus—#33
L. 12; W. 19; Wt. 4 oz.

IDENTIFICATION: A fat, chunky, dark body and a long bill on a shore bird of the open mud flats, together with a finely barred white tail and a pale gray rump patch that tapers to a point up on the lower back, mark the dowitcher.

HABITS: Little is known about the breeding grounds of this snipelike bird, but migrant flocks are commonly seen on their way south through our northern states by the last week of June. Dowitchers show preference for mud and sand flats of coastal bays, and both here and inland they frequent reedy marsh borders and marsh creeks. Inland they also occur about rain

pools and the muddy shores of lakes and ponds. The compact flocks often stay well bunched, even after they alight to feed. Tame, rather sluggish, and methodical, they wade about in shallow water, probing with vertical up-and-down thrusts of their long bills. Marine worms, particularly clam worms, are the most important food along the coast. Aquatic insects are everywhere important in the diet, larvae of midges coming first, followed by those of crane, soldier, horse, brine, and dance flies. Small snails and other mollusks are taken, also crustacea and small quantities of seeds of pondweeds, bulrushes, and other marsh plants. The so-called long-billed and short-billed dowitchers, though usually classified as races, differ considerably in appearance and ecology and may prove to be distinct species.



VOICE: The call in flight is composed of 2 or 3 whistled *pheu* notes in a rising series, generally softer and more rapid than the similar notes of the lesser yellowlegs. The song in flight is a short, clear, liquid gurgle or twitter.

NEST: (P.) A grass-moss-lined depression in a hummock in open, wet grass-tundra or, farther south, in the spruce-tamarack-dotted tundralike muskeg of the Canadian forest. The 4 eggs (1.6 x 1.1) are greenish- to olive-buff, spotted with browns.

RANGE: (M.) Breeds from the west side of Hudson Bay west to w. Alaska and from the shores of the Arctic Ocean south to n. Manitoba, c. Alberta, and c. Alaska. Winters from South Carolina, the Gulf Coast, and c. California south to c. Brazil and Peru. Migrates along both coasts, where it is abundant, and in the interior, where it is generally far less common.

Stilt Sandpiper*

Micropalama himantopus—~~33~~
L. $8\frac{1}{2}$; W. $16\frac{1}{2}$; Wt. $2\frac{1}{2}$ oz.

IDENTIFICATION: The rusty head stripes and finely barred under parts of spring birds are unmistakable. In fall the white eye stripe, scaled back, strongly greenish-yellow legs, and the long, heavy, tapered bill make these birds quite unlike the lesser yellowlegs, with which they are often confused. Actually the stilt sandpiper looks and acts more like a short-billed, long-legged, pale-breasted dowitcher. In flight its wings are without stripes and only the upper tail coverts are white.

HABITS: Away from its regular migration route across the Great Plains the stilt sandpiper is of irregular occurrence, varying greatly in numbers from one year to the next. Its favorite haunts are quiet, shallow pools where it can wade about up to its breast as it plunges its bill into the mud with a vertical, dowitcher-like motion or sweeps it from side to side along the bottom. The small flocks usually stay bunched together as they walk about feeding in a slow, methodical manner, often working for several seconds with their bills under water. Low water in ponds and lakes of the interior or tidal changes along the coast produce the type of shallows in which they like to feed. Sometimes, however, they are seen on open beach or in dry upland pastures. The small, wormlike larvae of various flies and other insects, small mollusks, crustacea, and seeds are the chief foods.

VOICE: A low, hoarse *whu* or a longer *whrru* ending with a sort of chatter.

NEST: (P.) On the ground in tundra country near water. The 4 eggs (1.4×1.0) are pale buffy with large brown blotches.

RANGE: (M.) Breeds from n. Manitoba and the west shore of Hudson Bay west across Keewatin and Mackenzie to n.e. Alaska. Winters in South America south to c. Argentina and Chile. The main migration route is across the short-grass plains between the Rockies and the tall-grass prairie. In fall it occurs east to the coast and occasionally offshore in Bermuda and the West Indies.

Semipalmated Sandpiper*

Ereunetes pusillus—~~36~~
L. $6\frac{1}{4}$; W. 12; B. .5–.9; Wt. 1 oz.

IDENTIFICATION: The fairly short bill, black legs, grayish general appearance, and the white of the sides showing in front of the bend of the wing help identify this sturdy little sand-

piper. The buffy edges of the feathers of the upper parts give juveniles a somewhat scaled appearance in early fall. They also have unstreaked, faintly buffy breasts and dusky, slightly olive legs.

HABITS: Over much of North America this is the most abundant shore bird. Along the coast, where it is seen by the thousands, it follows the waves in and out along the beach and feeds everywhere over the wet sand and mud flats at low tide. Many also work back along the marsh creeks and visit the shallow pools of the high salt-hay meadows. At high tide those that have been feeding near the water huddle in compact flocks on the dry sand of the upper beach to rest until the tide ebbs. Here they balance on one foot with their bills tucked into their back feathers, sleepily hopping away from an intruder until forced to put down the other foot and run. When feeding, these little birds are very active, picking and dabbling here and there, seldom taking time to probe deeply or persistently in one place. Inland they frequent muddy lake shores, river bars, and rain pools in plowed land. Mid-July sees adults coming south, as they leave the young to fend for themselves when 10 days to 2 weeks old and just learning to fly. Not until a month later do the young birds begin to follow, still in their buffy juvenile plumage, which sometimes causes them to be mistaken for the larger Baird's sandpiper.

VOICE: The flight call is a hoarse, shrill *cherk*. When flushed the bird utters an abrupt *ki-i-ip*. Various other chipping, twittering, and rolling notes are heard from a flock. The song uttered as the bird hovers on quivering wings at a height of 30 to 50 feet is an uneven quavering trill or cicada-like buzz ending with a few sweet goldfinch-like notes. Posturing birds also give a little whinny as they run about on the sand. Most of our shore birds go through at least part of their courtship display and occasionally give their interesting songs as they pass through the United States on their northward migration; these should be carefully watched for, especially in May and early June.

NEST: (I. 18, P.) A depression lined with willow leaves and grass on a ridge or knoll in low, wet, grass-tundra, often near a pool or along the coast in grassy dunes. The 4 eggs (1.2 x .84) are pale white to olive-buff with reddish-brown blotches.

RANGE: (M.) Breeds from n. Labrador, s.w. Baffin Island, n. Keewatin, n. Mackenzie, and n. Alaska to n.e. Siberia and south to James Bay, n. Manitoba, and the Yukon delta. Win-

ters from South Carolina and the Gulf Coast south to s. Brazil and Peru. In spring it occurs from the Atlantic coast to the Rockies. In fall it moves south on an even broader front from interior of British Columbia to well off the Atlantic coast, where it is a common fall visitor to Bermuda and the West Indies.

Western Sandpiper*

Ereunetes mauri—#36

L. 6½; B. .83-1.25

IDENTIFICATION: The long bill, tapering from a heavy base and slightly decurved at the tip, and in spring the rusty crown and back and more heavily streaked breast are helpful characters. Fall birds are hard to identify, but they often have rusty scapulars and are quite pale about the head. As in the preceding species, the feet are partly webbed; i.e., semipalmated.

HABITS: This bird is so much like the semipalmated sandpiper that the two species were not separated until 1864. Audubon, Wilson, and other early ornithologists failed to distinguish them, and it takes an expert to separate them in the field except for particularly long-billed or very strongly marked individuals. Because of the difficulty in telling them apart we know little about the western's migration routes to and from its southeastern wintering grounds. There are few records of the birds from the interior. Apparently their numbers along the North Atlantic coast vary greatly from year to year, depending, presumably, upon where the flights hit the coast as they come in from the Northwest. The habits of this species seem to be identical with those of the semipalmated, though one observer has suggested that westerns often seem to work in deeper water, where they have to feed with the head completely immersed.

VOICE: The flight call is a *kreeep* note, coarser than the similar note of the semipalmated and more plaintive or querulous. The other notes and the song are similar to the semi's.

NEST: (I. 21, P.) A grass-lined depression in the ground in a wide variety of sites from low, moist areas where it is hidden by grass to dry, upland tundra and the moss-covered lower slopes of mountains. The birds are remarkably tame and fearless about the nest. The 4 eggs (1.2 x .86) are cream-colored, heavily blotched with rich browns.

RANGE: (M.) Breeds in n.w. Alaska from Point Barrow south to the Yukon delta. Winters from North Carolina, the Gulf

Coast, and Washington south to Venezuela and Peru. The main migration route is up and down the Pacific coast, birds wintering in the Southeast apparently returning directly northwest across the interior. In fall they move east on a wide front, some striking the c. New England coast, the numbers increasing southward toward the Carolinas and Florida, where they are abundant.

Buff-breasted Sandpiper* *Tryngites subruficollis*—~~33~~ 33
L. 8; W. 16½; Wt. 2¼ oz.

IDENTIFICATION: The uniformly buffy under parts, including under tail coverts, and the yellowish legs are diagnostic. In flight the wings show a light center area on the upper surface and are largely pure white below. There is a narrow line of dark down the center of the rump and tail. Its long neck, round head, chunky body, and small, weak bill give the bird a ploverlike appearance, which is accentuated by its alert, head-high carriage.

HABITS: These little shore birds are found in short-grass prairie, rough or sparse pasture, or burnt-over grassland, where their dry-grass color renders them almost invisible. They are very gregarious and if not in a small flock of their own are with other shore birds, common associates being golden plovers, upland plovers, and (years ago) Eskimo curlews, but, rather than be alone, buff-breasts will join other shore birds in habitats wetter than they normally frequent. To avoid detection they freeze at alert with head high and often remain behind when their companions fly. Frequently they are tame to the point of stupidity, trying to escape by running, not rising until almost stepped on, and then, often as not, flying only a few feet. In flight even a single bird twists and turns, showing its yellowish body and dark-bordered white underwing surfaces. Whole flocks often perform such evolutions only a few feet off the ground. The buff-breast's courtship posturing, in which one wing (or sometimes both) is extended and held at an unusual angle or raised as high as possible over the head while the bird stands upright, is most remarkable. The food of the species is largely insects—beetles and their larvae and the larvae and pupae of flies. Like the Eskimo curlew, these birds were usually reported to be excessively fat. Most occurrences along the Atlantic coast are in September and suggest individuals blown in by strong easterly winds from an offshore migration route.

VOICE: The spring call is a sharp, thin *tik* or series of such notes that recalls the sound made by striking two small stones together. When flushed, young birds in fall utter an abrupt, harsh *crik*, not unlike the pectoral's note.

NEST: (P.) A thinly lined depression in the high, dry reindeer-moss tundra of the Barren Grounds. The 4 eggs (1.5 x 1.0) are pale buff, boldly blotched with browns.

RANGE: (M.) Breeds in n. Alaska and n.w. Mackenzie and winters in s. Argentina. In spring these birds seem to come across the Gulf of Mexico to the coastal prairies of w. Louisiana and e. Texas and then fly northwest across the Great Plains, going north through Canada just east of the Rockies. Some, largely young birds, return by the same route, but there are many indications of a considerable movement to the east coast of Canada and an offshore flight to South America similar to that of the golden plover and Eskimo curlew, birds that have much in common with this species.

Marbled Godwit*

Limosa fedoa—~~34~~

L. 18; W. 32; B. 4¼; Wt. 12 oz.

IDENTIFICATION: The buff-brown appearance, mottled above, including the tail, and finely barred below, is distinctive, in connection with the long, pink-based, upturned bill and blue-gray legs. In flight the upper wing shows a narrow black border along the front edge and a patch of pinkish-cinnamon. Below, the whole wing lining is pinkish-cinnamon, set off by a black patch near the bend and by the black tips to the primaries. In winter the birds lose most or all of the barring on the breast and sides.

HABITS: One hundred years ago Audubon reported these big godwits as abundant in migration from Massachusetts to Florida. Apparently in those days the godwit population split after the breeding season into 3 groups. One moved almost due east to the North Atlantic coast, another south down the Mississippi Valley, and a third went west to the California coast. Today only the migrants to California have recovered anything like their original abundance, the other 2 units being so small that the birds are hardly more than rare stragglers to their old haunts.

The breeding grounds are in extensive grassy areas, where the birds feed largely on insects, but as they gather into flocks in July they move to the muddy shores of lakes. Along the Pacific coast they feed on the sandy outer beaches and

the flats of the bays, but along the Atlantic coast they seem to like the high salt marsh and its ponds and the tidal flats near inlets. In all these places they probe in the soft ground for food, often inserting the bill to its full length to obtain worms, crustacea, and small mollusks.

VOICE: These noisy birds have a variety of loud calls ranging from a harsh *kerk* to 2- or 3-syllable calls accented on the second or middle syllable. Depending on the bird's mood, these are slow and even, at times musical, or rapid and harsh.

NEST: (P.) A slight hollow in short grass out in open grassland. The 4 eggs (2.2 x 1.5) are olive-buff, lightly and irregularly blotched with dull brown.

RANGE: (M.) Breeds from s. Manitoba and s. Alberta east to Minnesota and south to South Dakota and Montana. Winters from South Carolina, the Gulf Coast, and s. California south to Peru. Occurs during the fall migration from s. New England south along the Atlantic coast and the entire California coast as well as inland. Moves north in spring up the California coast and the Mississippi Valley.

Bar-tailed Godwit
(Pacific Godwit)

Limosa lapponica—~~35~~
L. 16; Wt. 11 oz.

IDENTIFICATION: The spring male is a solid, rich pinkish-cinnamon over the entire under parts from the tail clear up onto the head. The female is much paler, often only slightly pinkish below with a streaked breast. In winter the under parts are white except for the breast and lower neck, which are gray and narrowly streaked in adults and buff and heavily streaked in young birds. In flight the long wings are pale below, uniformly colored above, and the lower back, rump, and tail area is white, increasingly barred with brown toward the rear.

HABITS: This is one of the abundant shore birds of the Old World, flocks of thousands occurring in the British Isles during migration and in winter. It is a strong flier that regularly covers many miles of ocean to reach practically all the islands of the Southwest Pacific. Since it nests at high latitudes around the Polar Sea where the hemispheres come together, it is surprising that we have so few records of it from North America. The bar-tailed should be looked for along our coasts in September on mud flats and sand bars. Here it wades, deeply probing at times to the full length of its bill for worms, crustacea, and mollusks. In flight it pulls

its head back onto its shoulders, which, with its rather short legs, gives it a heavy appearance.

VOICE: The flight call is a low, barking *terrek, terrek*.

NEST: (P.) In a depression hidden by grass on a dry ridge in rolling upland tundra or on the lower mountain slopes. The 4 eggs (2.2 x 1.5) are greenish or brownish with a few brown markings.

RANGE: (M.) Breeds from n. Scandinavia east along the Arctic coast to n.c. Alaska and south to the Yukon delta. Winters south to c. Africa, India, Australia, and from Hawaii to New Zealand. Accidental on the Atlantic coast.

Hudsonian Godwit*

Limosa haemastica—~~34~~
L. 15; W. 26; Wt. 11 oz.

IDENTIFICATION: In spring the finely black-barred, reddish under parts fading to white about the head and broadly barred with white toward the tail are distinctive. Fall birds look like sedate greater yellowlegs or slender, short-billed willets, but in flight they show clear white upper tail coverts in strong contrast to the sooty-black tail with its narrow white tip. The upper wing surface shows only a narrow white line; underneath, the axillars and linings are a very dark sooty-brown.

HABITS: Although years ago this godwit is reported to have occurred in flocks of thousands in Argentina, Audubon never saw a live one. Since it followed the same migration route as the once incredibly abundant Eskimo curlew, it is a wonder that it survived the hunting period that brought the latter to virtual extinction. Today, however, it seems to be increasing rapidly, as it is regularly noted in some numbers within the limits of its restricted range. On the Atlantic coast the birds are seen after strong easterly winds in late August or September. Like the closely related black-tailed godwit of Europe and Asia, this species frequents muddy shores and shallows. Inland they are found on lake and pond shores and marsh openings. Along the coast they are attracted by broad tidal flats and sandy shores about inlets and river mouths. The long bill probes with a rapid thrusting action, and the birds often feed in water so deep that the head is completely submerged.

VOICE: Rather silent. The flight call a low, double *ta-it*.

NEST: (P.) On the ground in open tundra, often near water. The 4 eggs (2.2 x 1.5) are olive-buff, lightly marked with dark spots of the same color.

RANGE: (M.) Breeds locally from Southampton Island west to n.w. Mackenzie and south to n. Manitoba. Winters in extreme s. Argentina, Chile, and the Falkland Islands. The spring migration route is north up the w. Mississippi Valley and Great Plains, and while some birds return in fall over the same route, most of them fly eastward to the Gulf of St. Lawrence region and then offshore to South America, stopping at times at Bermuda and Barbados.

Ruff

(♀ Reeve)

Philomachus pugnax—~~31~~

♂ L. 11; ♀ L. 9

IDENTIFICATION: Breeding males are extraordinary-looking birds with elongated ear tufts and breast feathers that vary in color from white to black through browns of many shades and may be plain or coarsely or finely barred. In winter sexes look alike. In spring the female's breast feathers become dark brown with white or buff edges, but otherwise there is little change. In flight ruffs have a narrow white line in the wing and always show 2 conspicuous, long, oval white patches on either side of the dark, central lower back, rump, and tail-covert area. The legs are rather short and vary from orange or yellow through greens or browns to grayish or flesh color.

HABITS: The ruff carries individuality in plumage coloration to the limit. Seldom do 2 males look exactly alike. In spring the species does not pair, but the males (ruffs), like male prairie chickens, have a display ground on which each bird has a fixed station. To this the females (reeves) come from the nearby nesting meadow or marsh to mate, often with several males in succession. The brilliance or unusualness of a ruff's adornments seems to influence the reeves in their choice. The species in general appears to prefer the muddy shores of fresh-water ponds or marshes and wet short-grass meadow or marshland, but most American records are from along the coast, where it often occurs about salt marshes and the banks of narrow, winding channels. It moves rather deliberately, probing the mud for food and seldom wading into the water. The food is chiefly insects (especially beetles), worms, crustacea, and mollusks and, in fall, seeds, including grains.

VOICE: These silent birds when flushed occasionally utter a low *tu-whit* or, in flight, a louder *teuuuu-i-toi*.

NEST: (I. 21, P.) A grass-lined depression in a meadow, marsh or grass clump on more open tundra. The 4 eggs (1.7 x 1.2) are pale gray, green, or buff, boldly spotted with sepia.

RANGE: (M.) Breeds from n. Scandinavia along the Arctic Islands and coast to e. Siberia south to w. France, Hungary, s. Russia, and n. Manchuria. Winters south to s. Africa, Ceylon, and Borneo. Within recent years usually at least one fall record for the Atlantic coast of North America, Barbados, or n. South America.

Sanderling*

Crocethia alba—~~37~~
L. 8; W. 15; Wt. 2½ oz.

IDENTIFICATION: A very pale-backed, white-breasted sandpiper in winter, the only dark area being a small patch at the bend of the wing. In flight the wings appear quite dark with a conspicuous long white line down the center. The legs and bill are always black. Adults may show more or less of the rusty-brown that suffuses the head, chest, and back in the breeding season, even in winter. In early fall young have dark, mottled backs and streaked and barred rumps, the latter being retained all winter.

HABITS: These big-headed, active, chunky little sandpipers, always in a hurry, are common on almost every ocean beach in the world at one season or another. Wherever they are, they nimbly follow the advancing and receding water's edge, probing vigorously for small crustacea and mollusks, often leaving a long line of holes and tossed-out sand in their wake. Occasionally at low tide they visit the sand flats and bars of bays near inlets or seaweed-covered rocks. Inland they are usually far less common, frequenting chiefly lake beaches and river bars and only occasionally mud flats. On dark mud the birds must recognize their conspicuousness, as one observer tells of a pair leaving such a spot to sit in a snowbank when attacked by a Cooper's hawk. Along the beach they rest on dry white sand, where they are almost invisible. Inland, as in the Arctic, insects are their chief food. Sanderling are not especially gregarious, and single birds feed by themselves as contentedly as in the small flocks in which they usually travel. Other birds join these flocks, but seldom is the reverse true.

VOICE: A shrill *twick, twick* is given as the birds flush, and a soft twitter is heard from feeding flocks.

NEST: (P.) A leaf-filled hollow near or in a small clump of vegetation growing on a barren open or stony place on a low ridge or terrace of the dry upland tundra. The 4 eggs (1.4 x .97) are olive with small brown spots.

RANGE: (M.) Breeds on the islands of the Arctic Ocean, n.

Greenland, and the coast of the Taimyr Peninsula region of Siberia. In North America breeds south through the many islands to Southampton Island. Winters from Virginia, the Gulf Coast, and c. California south to s. Chile and s. Argentina; also s. Africa, Australia, Hawaii, and the n. South Pacific islands.

AVOCETS and STILTS

Family Recurvirostridae

American Avocet*

Recurvirostra americana—~~35~~ 35
L. 18; W. 33; B. $3\frac{1}{4}$ –4; Wt. 12 oz.

IDENTIFICATION: This big shore bird is unmistakable. Various shades of gray replace the cinnamon of the head, neck, and breast in winter. In flight the back and tail are white, the outer wing black, its inner side white with a diagonal black band. Underneath, the flight feathers are dark in contrast with the pure-white wing lining.

HABITS: The present home of these tame and inquisitive birds is around the borders of the broad, shallow alkaline lakes and sinks of the Great Basin country and the more sparsely vegetated shallow marshes of the plains. When migrating they are also attracted to flooded meadowland and occasionally visit the shallow tide pools of the coastal marshes. Avocets feed like roseate spoonbills, walking rapidly or running in fairly deep water, swinging the bill from side to side on the muddy bottom. Often a large group feeds shoulder to shoulder in a long, evenly advancing line; at other times they swim with their webbed feet and feed by tipping up like puddle ducks. They take numbers of shrimp and other small crustacea, aquatic insects, and many seeds of aquatic and marsh plants. Insects are also frequently picked or “skimmed” from the surface. This species flies with the neck extended, and at times flocks indulge in elaborate maneuvers. Few American birds are handsomer than the avocet, and an attempt to restore it as a breeding species to the marshes of the Atlantic seaboard would be a fascinating wildlife-management project.

VOICE: The protest note is a loud, yelping *wheep*.

NEST: (P.) A depression, often with only a slight lining, on the bare, open ground of a mud flat. In times of high water the nest is added to in order to keep the eggs dry, and it may eventually become a mass of sticks, grass, and other debris a

foot or more high. Loose colonies are established. The usual site is the sun-dried mud of an inland slough or alkaline flat on ground that is often under water earlier in the spring. The nest depression is in the open without concealment, although rank weeds may later come up and hide it. The 4 eggs (2.0 x 1.3) are olive-buff, spotted and blotched with blackish-brown.

RANGE: (P. M.) Breeds from s. Manitoba, s. Alberta, and e. Washington south to s. Texas and s. California. Winters from s. Texas and c. California to Guatemala. Once bred eastward to the Atlantic coast, at least in s. New Jersey, where now it is only a casual visitor in the fall.

Black-necked Stilt*

Himantopus mexicanus—#35
L. 14½; W. 28; B. 2-2¾

IDENTIFICATION: In flight, solid black above except for a white rump and upper tail coverts and a gray tail. Females, and especially young, are less black and more brownish on the back and have paler legs.

HABITS: The noisy, aggressive stilt breeds in small, loose colonies about shallow bodies of water. Although it is often most abundant around fresh water and is quickly attracted to irrigated or flooded fields and pastures, it also breeds near stagnant, alkaline, or brackish ponds. In many areas, especially about alkaline bodies of water, the avocet and stilt are closely associated. Along the coast stilts breed about the brackish ponds and flats of the upper salt marsh back against the upland and in the brackish to fresh ponds back of the beaches or in the center of coastal islands. This bird is a very active feeder, running about picking objects from the surface of the water or mud, plowing the water with its bill, and occasionally probing deeply into the mud. Considering the length of its legs (8 to 10 inches), it seems to feed most of the time in rather shallow water. Aquatic beetles, bug and fly larvae are staple foods. Snails and crustacea, although eaten, are not generally important. It has been about 100 years since these birds nested on the coast as far north as New Jersey, where today even stragglers are rare. Since hunting rather than habitat destruction was the cause of their disappearance, stilts, even more readily than avocets, could probably be re-established as breeders by egg transfers to nests of other shore birds like willets.

VOICE: The alarm call is a sharp, yelping *pep, pep*, which rises

in pitch to a frantic *yip, yip, yip*. Many of the notes suggest the call of a tern.

NEST: (P.) On the ground in the open or hidden by vegetation on or near the shore, or on a small island or hummock in a shallow body of water. The nest is usually a grass- or shell-lined scrape, but as incubation progresses these, like so many shore birds, often keep adding material, and if a flood comes they may engage in a frantic race to build it high enough to keep the eggs above water. The 4 eggs (1.7 x 1.2) are buffy, spotted with brownish-black.

RANGE: (P. M.) Breeds from South Carolina (formerly s. New Jersey), the Gulf Coast, Nebraska, n. Utah, and c. Oregon south through the West Indies and Mexico to n. Brazil, Peru, and the Galápagos Islands. Winters south from the West Indies and Mexico. Very similar birds occur all over the warmer parts of the world, and many ornithologists call them all one species, making our birds simply a race.

PHALAROPES

Family Phalaropodidae

Red Phalarope (Grey Phalarope)

Phalaropus fulicarius—~~32~~
L. 8½; W. 15

IDENTIFICATION: The extensively reddish breeding females are unmistakable. Males are paler red, with less white on the cheek, and are streaked instead of solid black on top of the head and neck. In winter the white forehead, pale blue-gray back (often brownish on rump and upper tail coverts), and the pale gray wings on which the broad white wing stripe and white tips to the secondaries are not too conspicuous are the best field marks. Compared with the red-necked, or northern, this is a larger, stockier, thicker-necked bird with a short, stout, broad-based bill. The bill and legs are more or less yellowish or brown. In winter the red phalarope is paler than the northern in all respects.

HABITS: In the two pelagic phalaropes we have shore birds, the numbers of which have not been appreciably reduced by civilization. They are still abundant over a vast breeding range in the Arctic. Only the virtual extermination of the whales of the Northern Hemisphere more than a century ago and the recent increasing pollution of the seas by oil from

ships' bilges are likely to have affected their welfare. To what extent the deadly fuel-oil droplets that so mat a bird's feathers that they can no longer insulate its body from the cold sea water have taken toll no one knows, but, like all sea birds, these must at times suffer from this modern scourge of oceanic bird life.

Fishermen call phalaropes "whale" or "mackerel" birds and watch to see where flocks settle, believing that they depend upon feeding schools of crustacea-eating whales, mackerel, or other fish to help them locate abundant supplies of the small reddish copepods, commonly known as brit, that are one of the phalarope's chief foods at sea.

The red is the more pelagic of the two. Only small numbers occur on or near land outside the Arctic except in the early morning after a very foggy night or during a severe storm with an onshore wind. At such times phalaropes may swim erratically about in small ponds behind the beaches or in the surf. Here they bob their stiffly held heads and dab in all directions for food. At other times these buoyant little ducklike birds spin around in one spot in characteristic fashion or tip up and feed off the bottom. Very rarely one is observed feeding on a mud flat or on a beach near the water's edge. Food in the North consists largely of gnats and their larvae and other insects. When feeding, this species is reported to make twice as many dabs in a second (5) as the red-necked. In fall, adults are early and rapid migrants. They have been reported off Buenos Aires by August 12, although young birds linger in the Arctic until the end of September. In these fall flocks a few birds, as a rule, retain enough reddish breast plumage to indicate the species.

VOICE: The common note is a sharp, whistled *weet*. There are other notes, some wheezy or grating, others extremely thin and high-pitched.

NEST: (P.) The site is usually near the coast in low, marshy tundra with scattered ponds where the birds can feed. The nest is generally a depression in the ground on a high spot in or near the marsh. It may be in the top of a sedge tussock in the marsh proper or it may be a well-made cup of grass supported in the vegetation over water. The 4 eggs (1.2 x .85) are olive-buff with bold, irregular brown spots.

RANGE: (M.) Breeds on the islands and coasts of the entire Arctic Ocean south to the Yukon delta, Southampton Island, and Iceland. Winters at sea south to Lat. 50° S. Migration wholly pelagic.

Wilson's Phalarope*Steganopus tricolor*—~~32~~
L. 9

IDENTIFICATION: Richly colored breeding female is unique, but male's only distinctive markings are a white spot on the hind neck, a pale chestnut wash on the side of the neck, and a long black needlelike bill. Juveniles are quite cinnamon on the upper parts and mottled and buff below. In winter the long black legs change to pale or greenish-yellow. In flight the bird has uniformly dark wings and a white rump and tail like a yellowlegs, but neither the largely white under parts nor the pale gray, scaled upper parts show streaking or spotting.

HABITS: This bird, the most beautiful of shore birds, is the only "landlubber" in its family. Although it rides on water as buoyantly as the others and has been recorded to have made as many as 247 consecutive spins, it does a large part of its feeding on foot in wet meadows, mud flats, and in shallow water where it can wade. Here it picks insects from the surface, probes vigorously in the mud, head under water like an avocet, and swings its bill from side to side along the muddy bottom. Rain pools in meadows and pastures attract it, as it eats large numbers of land, as well as aquatic, insects. This phalarope, which breeds in loose colonies about suitable shallow ponds and marshy land, once occurred throughout the entire northern prairie region east to northwestern Indiana.

VOICE: A distinctive, soft honking or trumpeting, also shriller and more nasal notes.

NEST: (P.) A grass-lined depression in damp meadowland and near a shallow body of water, in the open in a mowed area or hidden in the taller grass of an unmowed one. The 4 eggs (1.3 x .92) are pale buff, well spotted with blackish-brown.

RANGE: (M.) Breeds from s. Ontario, s. Manitoba, c. Alberta, and s. British Columbia south to n. Indiana, c. Iowa, Nebraska, Colorado, Utah, and c. California. Winters inland from c. Argentina and c. Chile south to the Falkland Islands. In migration rare east of the plains and does not reach the Pacific coast north of s. California. On the Atlantic coast, although rare, it is seen with some regularity in fall.

Northern Phalarope
(Red-necked Phalarope)*Lobipes lobatus*—~~32~~
L. 7; W. 14

IDENTIFICATION: The color pattern of the breeding plumage is distinctive, although in the male it is duller and less bold,

being extensively flecked with white, gray, or brown. This species has a smaller head and a slimmer neck than the red phalarope, a much finer, almost needlelike bill, and legs that are blue-gray to blackish. In winter the darker gray, conspicuously streaked back and darker wings, on which the white wing stripe is more noticeable, are good field marks. The dark eye-to-ear patch generally separates a phalarope from a sanderling.

HABITS: This graceful, dainty bird is a common associate of the red phalarope at sea, but it also migrates north and south across the n. Great Plains in considerable numbers. Although seldom seen along the Atlantic coast south of New Jersey, and then only after storms, this species is not uncommon on the Pacific coast along the ocean front, on bays or on inland waters near the shore, or, especially in fall, on lakes in the interior. Like all phalaropes, this species has lobed toes and semipalmated feet and prefers to feed and rest afloat. It is very gregarious, nesting in loose colonies and gathering at sea in large flocks that maneuver in typical shore-bird fashion. On land small flocks up to 30 birds are the rule. Like the red, these phalaropes seek out feeding bowhead whales and plankton-feeding fish or gather in tide rips and among patches of drifting seaweed. Few birds are so fearless, individuals occasionally allowing themselves to be picked right out of the water.

Phalaropes are notable as one of the few cases among birds where the ordinary roles of the sexes are reversed. The female wears the bright plumage, arrives first at the breeding ground, advertises for a mate with display flights and calls, competes with other females for the male's attention, and permits, or makes, him do most or all of the incubating of the eggs. The pair remain together, however, and seem to share the care of the precocial downy young until they leave the nest shortly after hatching and go to a nearby pond. On land these phalaropes seem dependent upon mosquito larvae, water bugs and beetles found in fresh water, and on the brine shrimp and alkali flies found in the saline and alkaline waters of the Great Basin country.

VOICE: Similar to but lower-pitched than the red's.

NEST: (I. 20, P.) A hollow in a mound or sedge tussock in a marshy area with scattered ponds, or in a lakeside marsh. The 4 eggs (1.2 x .83) are olive-buff, boldly spotted with brown.

RANGE: (M.) Breeds from the Arctic Ocean south to about

Lat. 55° N.; i.e., from c. Greenland, Melville Island, and Alaska south to Labrador, James Bay, n. Manitoba, the Upper Yukon Valley, and the Aleutian Islands; also in Iceland, Spitsbergen, and the Arctic coast of Eurasia south to the British Isles, Baltic States, c. Russia, and Sakhalin. Winters at sea probably from just north of the equator to Lat. 60° S., at least off South America.

SKUAS

Family Stercorariidae

Pomarine Jaeger*
(Pomatorhine Skua)

Stercorarius pomarinus—~~21~~
L. 22; W. 48; Wt. 27 oz.

IDENTIFICATION: This species has a more extensive pale area in the center of the upper wing (produced by the white shafts and bases of the primaries) and below (produced by white bases to primaries) and is a larger, broader-winged bird than other jaegers. In adults the projecting ends of the elongated central tail feathers, twisted through 90 degrees so that the web is vertical, produce from the side a distinctive dark blob beyond the tail. The 2 color phases vary in proportion from one breeding area to another, with the light phase running 80 to 95 per cent. In the light phase the pomarine generally has a more pronounced breast band than other jaegers and dusky barring on the flanks. Young lack the elongated tail feathers and can only be told by their larger size and much heavier bill.

HABITS: Jaegers are the most abundant birds of prey in the Arctic. There this species feeds on lemmings, eggs, small birds and young of all bird species, as well as on carrion and what food they can steal from other sea birds. Later, when they go to sea for the winter, they are attracted by gatherings of feeding terns, gulls, or shearwaters, all of which they rob. Jaegers can, however, catch their own food and often follow ships like gulls. The pomarines' flight is steady, deliberate, and powerful, but they seem less active and aggressive than the other jaegers. They move north off our coasts from mid-April to late May and come south in late August and September, their numbers varying greatly from year to year. Few are ever seen from shore, and to become acquainted with these and the many other interesting birds of the open ocean

that a landlubber seldom sees, it is necessary to visit the off-shore fishing banks.

VOICE: Varied single- or double-noted squealing, hawklike whistles.

NEST: Widely scattered over low, swampy tundra, a grassy cup on dry mounds, occasionally on cliff ledges. The 2 eggs (2.4 x 1.7) are olive or brown, sparingly spotted with brown.

RANGE: (M.) Breeds on the islands and coasts of the entire Arctic Ocean, south in the Western Hemisphere to Iceland, Southampton Island, and the Yukon delta. Winters at sea from Virginia and probably from Lower California to the waters off Peru, w. Africa, and e. Australia. Of rare but occasional occurrence on large bodies of inland water like the Great Lakes and the Caspian Sea.

Parasitic Jaeger*
(Arctic Skua)

Stercorarius parasiticus—~~21~~
L. 17; Wt. 18 oz.

IDENTIFICATION: This bird has long, pointed, slender wings with a very sharp angle at the bend and a smaller, more tapered bill than the preceding species. Below, the outer flight feathers, though paler than the wing lining, do not form a sharply defined white patch. On the upper wing surface the light area is mainly due to the white quills of the primaries. The elongated (2-3½ inches longer) pair of central tail feathers are diagnostic, though lacking in young birds. There are 2 color phases: the young of both are similar. It takes 3 years for the young to mature, becoming progressively less barred with dark or white, depending upon the phase.

HABITS: This is the jaeger that commonly harries flocks of feeding terns and attaches itself to migrating flocks of arctic terns and travels with them across the ocean. Swift and agile beyond belief, the parasitic jaeger follows every twist and plunge of a tern until the desperate bird gives up its prey, which the jaeger catches before it hits the water. In the North this jaeger feeds to some extent on lemmings, but it is the scourge of longspurs, horned larks, redpolls, and snow buntings, as well as of the smaller shore birds and young ducks. It catches and carries its prey in its bill and commonly swallows it whole, feathers and all. These jaegers move north in April and May and go south from the last week in July to early October. In migration the light phase seems dominant along our coasts, but on the breeding grounds the proportion of dark to light birds varies from 0 to 95 per cent from one

region to another. In southern areas and near the coast dark birds predominate, but inland and in the Far North the lighter phase is commoner.

VOICE: A dry *tick a tick-tick* or *tuk-tuk*; also other wailing or squeaking notes and a mewling *ka-aaow*.

NEST: A depression, often well lined, in flat, grassy tundra or open stony ground near the coast, or at higher elevations inland near lakes and, in the South, in open moorland. The 2 eggs (2.2 x 1.6) are usually olive with brown markings.

RANGE: (M.) Breeds on the islands and coasts of the Arctic Ocean south to Scotland, n. Labrador, Southampton Island, n. Manitoba, s. Mackenzie, s.w. Alaska, and Kamchatka. Winters from Florida and c. California south to the fringes of the Antarctic Ocean. Its migration is largely pelagic, but in fall it is the jaeger most often seen along our coasts and on our inland waters, where it is at all times rare.

Long-tailed Jaeger*
(Long-tailed Skua)

Stercorarius longicaudus—~~21~~
L. 21; Wt. 12 oz.

IDENTIFICATION: Although longer over-all, this bird has a shorter body than the preceding and slimmer wings. A dark phase is virtually unknown, and the normal bird is grayer-backed and cleaner-breasted than the parasitic. It shows little white on the underwing and generally only the 2 outer quills of the primaries are white above. In adults the central pair of tail feathers are 5 to 8 inches longer than the rest and are quite distinctive. The legs are blue-gray rather than black. Young are barred and grayer, with less white on the wing than in the other species.

HABITS: This little jaeger has the grace and buoyancy in the air of a swallow-tailed kite or frigate-bird. It hovers like a tern and sails, soars, and engages in wild chases through the sky, apparently in a spirit of play. In years of lemming abundance it is a common breeding bird in most parts of the Arctic. So dependent is it upon those small mouselike animals that when they periodically become scarce in a given locality, as they do every 4 years, the long-tails move on to breed, or at least to summer, elsewhere. This species spends little time harrying gulls or terns, but rounds out its summer diet with insects, many of them captured in mid-air, and with fish and, rarely, small birds. In fall, before it goes south, it is reported to fatten up on that arctic staple, the crowberry. Although the bird is common in the Arctic and in some parts of the

Southern Hemisphere, its migration route between these two points has long been a mystery. Evidently the migration is performed rapidly at considerable elevations, with few, if any, feeding stops, since the birds in spring are on the breeding ground ahead of similar migrants and already mated when others arrive. In fall they depart in what appear to be family groups. May and September records from Bermuda and others from shipboard indicate a mid-ocean rather than a non-stop overland route.

VOICE: A shrill, harsh *cree-oo* with a roll, plus other similarly hard single and double notes.

NEST: (A.) A depression on a knoll or ridge in the tundra, often on the dry, rolling uplands or lower mountain slopes. The 2 eggs (2.2 x 1.5) are brownish-olive, irregularly marked with brown.

RANGE: (M) Breeds on the islands and coasts of the entire Arctic Ocean south in North America to c. Greenland, n. Labrador, n. Mackenzie, and the Yukon delta. Little is known of its wintering grounds, which appear to be well south in the oceans of the Southern Hemisphere. In the Northern Hemisphere it migrates through the central ocean areas and is seldom seen either along the coast or inland.

Skua*
(Great Skua)

Catharacta skua—~~2~~ 21
L. 21; W. 59; Wt. 2½ lbs.

IDENTIFICATION: The extensively white bases of the primaries form a large pure-white patch in the wing that is distinctive. Young birds lack the pale yellow streaking on the neck of summer adults, while the light spotting on the back and the white wing patch may be so reduced that it shows only on the under side of the wing.

HABITS: This is the world's only bipolar breeding bird, although its role in the Northern Hemisphere is minor compared with its abundance and dominance in the Southern Hemisphere. There it is a gull-like scavenger on carrion and other refuse both on land and at sea, a catcher of fish, shrimp, and surface-swimming plankton animals, a robber of other sea birds, and an aggressive predator, catching and eating small sea birds like petrels and the weaklings of any species. During the breeding season it usually nests near penguin or petrel colonies, preying on both eggs and young. Its rapacity extends even to its own young, one of which generally strays too far from the nest to be recognized and is eaten, but the one that

survives is defended against man and beast with unequaled ferocity and fearlessness. In the Northern Hemisphere this species has been increasing rapidly in recent years, and there seems to be no reason why it cannot eventually colonize the whole Arctic.

In the air the skua is a massive-looking bird with a short, upcocked tail. It soars well and flies with deep, rapid strokes of its broad, powerful wings that propel it with unsuspected speed. It looks more like a miniature eagle or hawk than a gull and has a strongly hooked bill and long, sharp, curved claws which are used in holding and tearing up prey but not for carrying food. Food is either swallowed at once or carried in the bill. Away from its breeding grounds, the skua is usually solitary, ranging widely over coastal waters and on the high seas, though in our region it is seldom seen from shore. At sea it often follows ships and, unlike the jaegers, often alights on water. Curious and always hungry, these birds at times crowd around a man skinning game or cleaning fish, accept food from his hand, and ignore all attempts to drive them away.

VOICE: Sharp, shrill, gull-like screams and at times a ducklike quacking note.

NEST: Loose colonies are often formed near breeding colonies of other sea birds. The site is on open ground or a rocky slope near the sea, generally on a high place like a cliff top or headland. The 2 brown or olive to grayish eggs (2.8 x 1.9) with dark brown spots are laid in a grass-lined scrape on the ground.

RANGE: (P. M.) Breeds on the shores of the Antarctic Continent, the islands of the antarctic and subarctic seas, and on the coast of South America north to c. Chile on the west. In the Northern Hemisphere it is a subarctic species, occurring in summer across the North Atlantic from s.e. Baffin Island, Greenland, and Iceland to the Faeroes and Orkneys, although only known to breed from Iceland east. Winters from Lat. 60° N. to the Sargasso Sea but is encountered south at least to the Gulf Stream all summer. Birds undoubtedly from the Southern Hemisphere range north in summer in the Pacific Ocean to the latitude of British Columbia and Japan, and the occurrence of skuas in greatest numbers in July, August, and September on the fishing banks off Newfoundland and Massachusetts suggests that the same thing may be true in the Atlantic.

Comparison of Average Length and Wingspread of Sea Birds usually seen in Flight

SPECIES	LENGTH	WINGSPREAD
Storm Petrel	6	—
Wilson's Petrel	7	15½
Leach's Petrel	8	—
Frigate Petrel	8	—
Least Tern	9	20
Black Tern	9½	—
Little Gull	11	—
Dusky Shearwater	11½	—
Long-tailed Jaeger (immature)	13	—
Bonaparte's Gull	13	32
Ross' Gull	13½	—
Sabine's Gull	13½	—
Common Shearwater	14	—
Franklin's Gull	14	—
Gull-billed Tern	14	34
Bridled Tern	14½	—
Forster's Tern	14½	30
Black-headed Gull	15	—
Noddy Tern	15	—
Parasitic Jaeger (immature)	15	—
Common Tern	15	31
Bermuda Petrel	15	35
Black-capped Petrel	15	38
Arctic Tern	15½	—
Roseate Tern	15½	—
Sandwich Tern	16	—
Yellow-billed Tropic-bird (female)	16	37
Sooty Tern	16½	—
Laughing Gull	16½	—
Ivory Gull	17	—
Common Gull	17	—
Kittiwake	17	36
Sooty Shearwater	17	42
Parasitic Jaeger	18	—
Black Skimmer	18	46
Fulmar	18½	41
Ring-billed Gull	18½	48
Royal Tern	19	43
Great Shearwater	19	43

SPECIES	LENGTH	WINGSPREAD
Long-tailed Jaeger	21	—
Cinereous Shearwater	21	45
Caspian Tern	21	53
Skua	21	59
California Gull	21½	—
Pomarine Jaeger	22	48
Lesser Black-backed Gull	23	—
Iceland Gull	24	55
Herring Gull	24	56
Glaucous Gull	28	60
Brown Booby	29	57
Red-footed Booby	29	60
Great Black-backed Gull	29	65
Yellow-billed Tropic-bird (male)	32	37
Blue-faced Booby	32	63
Gannet	36	72
Magnificent Frigate-bird	40	90
Brown Pelican	50	80
White Pelican	60	100

GULLS and TERNS**Family Laridae****Glaucous Gull***

Larus hyperboreus—~~22~~
L. 28; W. 60

IDENTIFICATION: The outstanding characteristics of this species and the next are their very pale gray upper parts and pure-white primaries. The glaucous is not only larger than the Iceland, as a rule, but it has a heavier head, a yellow eye ring, and a longer, stouter bill (even larger than a herring gull's). Juveniles are creamy-buff and brown, uniformly pale, with flight feathers as pale as, or paler than, the rest of the wing. In their second and third years the young birds gradually become uniformly creamy-white all over. The young start out with a whitish bill with a dark tip that fades as the bird matures, then becomes yellow with red spots.

HABITS: This huge, powerful gull with its broad, heavy wings and steady soaring flight has little of the bend in the wing seen in most gulls and often looks very much like a soaring hawk. To a large extent it is a bird of prey, living during

the summer chiefly on the young of murres and other alcids, ducks, and gulls. Even the adults of species as large as doves and plovers are captured, often in the air, and swallowed whole, feathers and all. At other seasons it robs gulls and diving ducks of their catches, searches far and wide for carrion and refuse of any sort, and also appears to do some hunting for sea food on its own. In winter it ranges along the edges of any open water and often gets quite far out to sea in favorable areas like fishing banks. To residents of the Far North the glaucous gull is the harbinger of spring, arriving about mid-April as the first migrant from the South.

VOICE: Very hoarse, loud, drawn-out, almost ravenlike croaks; also shriller, more typically gull-like screams.

NEST: On ledges near the tops of cliffs or on isolated high areas, generally near colonies of murres and the other sea birds on which they prey, also on small islets in tundra lakes or in coastal dunes. The nest is a substantial cup of grass, moss, and seaweed. The 3 eggs (3.0 x 2.1) are clay color to brown, irregularly marked with chocolate-brown.

RANGE: (P. M.) Breeds on the islands and coast of the Arctic Ocean south in North America to Newfoundland, James Bay, n. Mackenzie, and the Pribilof Islands. Winters from the edge of open water south to Long Island, the Great Lakes, and c. California and abroad to the Mediterranean and Caspian seas and Japan.

Iceland Gull*

Larus leucopterus—~~22~~
L. 24; W. 55

IDENTIFICATION: Coloring similar to the preceding except that the eye ring is red and in one race (kumlieni) there are grayish markings near the tips of the primaries. The Iceland is smaller but proportionately longer-winged, the folded wings extending well beyond the tail. Its shorter, weaker bill and small head (smaller than a herring gull's) give it a much more gentle look. Juveniles are darker than young glaucous gulls, but the species matures faster. The bill is at first uniformly blackish but becomes light greenish by the second year.

HABITS: In the air this longer-winged white gull seems more graceful and buoyant than the glaucous. It also appears to be less predatory, depending more on fish caught through its own efforts and refuse of all kinds. Young in their first fall eat crowberries until they develop fishing skill. In winter,

like so many gulls, this species is best looked for about piers where fish are being cleaned or around garbage dumps and sewer outlets.

VOICE: Like the herring gull, but shriller.

NEST: In colonies, often large ones on ledges near the top of cliffs, usually those frequented by nesting kittiwakes and other sea birds. Occasionally it nests lower down, on or close to a sandy shore. The 2 or 3 eggs (2.7 x 1.9) laid in a grass, moss, and seaweed nest are like those of the glaucous.

RANGE: (P. M.) Breeds on the Arctic Islands of North America, Greenland, and Jan Mayen Island. Winters from the edge of open water south to n. New Jersey, the Great Lakes, and Great Britain.

Great Black-backed Gull*

Larus marinus—~~26~~
L. 29; W. 65

IDENTIFICATION: The blackish mantle and great size distinguish adults. Young are notably light-headed and paler below than the young of herring gulls.

HABITS: This gull, largest of its kind, occupies much the same niche in the wildlife community as its more northern relative, the glaucous. A majestic bird, fond of soaring and wheeling on high, it usurps the most elevated nest sites on an island and when with other gulls insists upon having the most commanding perch available. In summer it preys on the eggs and young of eider ducks, cormorants, terns, and other gulls and takes adults of smaller species like Leach's petrel and guillemot. At other seasons it makes its living by robbing other gulls, eating carrion and hunting sea food on the flats at low tide. In winter it becomes gregarious, associating freely with herring gulls, although as a rule continuing to assert its dominance.

In recent years the species has extended its breeding and wintering range southward and has become more abundant on both sides of the Atlantic. On our coast this has followed the increase and spread of the herring gull and the double-crested cormorant, which has been so great and rapid as to lead to demands for artificial checks on their numbers. But, as invariably happens if man does not interfere, nature provides checks. In this case it seems likely that the presence of the highly predatory black-back will tend to keep down the populations of the herring gulls and cormorants.

VOICE: A variety of harsh barking calls or croaks and screams, in

general lower-pitched and more guttural than those of other gulls.

NEST: (I. 27) Solitary or in small colonies, rarely large ones, on small coastal islands or isolated headlands, also occasionally on an island in a lake a mile or two inland. The nest is a mass of debris in a hollow in the ground or among rocks on the highest available open area. The 3 eggs (3.1 x 2.1) are buffy-brown to olive, spotted and blotched with dark brown.

RANGE: (P. M.) Breeds on the coasts of the North Atlantic and adjacent parts of the Arctic Ocean from n. Labrador, c. Greenland, Iceland, n. Scandinavia, and n.w. Russia south to Long Island and Brittany. Winters from s. Greenland south to the Great Lakes, North Carolina, the Canary Islands, and the Mediterranean and Caspian seas.

Lesser Black-backed Gull*

Larus fuscus—~~26~~
L. 23

IDENTIFICATION: The mantle in this species varies from slate-black to slate-gray, but the yellow feet are distinctive and the dusky streaking on the head and neck in the winter plumage is more extensive than in the great black-backed. Juvenile birds may be darker than those of a herring gull but are often indistinguishable, as the trend toward yellow legs is not apparent until the second or third year.

HABITS: This gull, an occasional wanderer from Europe to our side of the Atlantic, and the herring gull apparently stem from a common ancestral gull population which originated somewhere in northeastern Siberia. As this Siberian species pushed out east and west to colonize nearby regions the new populations tended to vary a little from the original stock. These units begat others until finally the two divergent lines met halfway around the world, that represented by the lesser black-back having apparently come from the east, that of the herring gull from the west across North America. Beginning with the present Siberian population (the Vega herring gull) and following each of the lines, one discovers that each group is so similar to its neighbors (often interbreeding with them) that they all appear to be merely races or subspecies of a single species, and yet when the lines meet the end groups breed side by side without interbreeding. This, the surest test of a valid species, poses a problem in nomenclature which some ornithologists have solved by putting all the birds in one superspecies. Why the herrings and the lesser black-backs did

not interbreed when they met is hard to determine, but the acquisition by the former of a 2-week-earlier breeding season may have had something to do with it. In behavior and habits the two remain almost identical, though at times the lesser black-back seems to be a bolder and more aggressive bird.

VOICE: Similar to the herring gull's, but generally somewhat lower-pitched.

NEST: (I. 27) In colonies of from a few to many pairs on rocky islets or headlands or, more usually, on open grassy, weedy, or brush-grown land, the nest itself varying from a sparsely lined scrape to a large pile of debris. The 3 eggs (2.7 x 1.8) vary from pale blue-green to brown, spotted with blackish-brown.

RANGE: (P. M.) Breeds from Iceland and the n. Russian-Scandinavian peninsula south to Brittany and the Baltic Sea. Winters from the British Isles, e. Mediterranean, and Persian Gulf south to the coasts and lakes of c. Africa.

Herring Gull*

Larus argentatus—~~22~~
L. 24; W. 56; Wt. 2½ lbs.

IDENTIFICATION: An adult gull with a pale gray mantle, pinkish or flesh-colored legs and feet, and white-spotted black wing tips is in North America always a herring gull. Some Old World races have yellow feet like a lesser black-back. The only seasonal change is a brown streaking on the head and neck which the birds acquire in winter. There is much individual variation in the rate at which young mature. Generally speaking, the first plumage change occurs in their second winter, when gray begins to appear in the mantle and the head becomes lighter. In the third winter the upper tail coverts become at least partly white, and by the fourth winter only a trace of dark remains in the tails of some individuals.

HABITS: (Age 17 yrs., 49 in captivity.) This species, the common gull of the Northeast, has been increasing rapidly in recent years and has extended its breeding range from e. Maine south to New Jersey. Whether this is a reoccupation of former breeding areas from which the bird disappeared when it was persecuted by eggers, plume hunters, and fishermen, or a real extension, no one knows. We do know, though, that the dumping of garbage, fishing wastes, and sewage into our coastal waters has expanded the food supply for all scavengers. It seems likely that this is permitting more gulls

to survive the winter, when starvation normally eliminates that fraction of a population which is in excess of the environment's carrying capacity. If so, we are witnessing the typical response of any wild animal to an expansion of the food supply during that period of the year when food is normally at a minimum and the amount available is critical in determining the population for the entire year. The most interesting question now is: At what level will the herring gull population stabilize itself under these new conditions? Much as we may hope that it will not go much higher because of the adverse effect it is having on tern colonies along the coast, the point at which it levels off will be controlled by nature's law of supply and demand, and possibly to some extent by great black-backed gull predation. The fact that herring gull populations are undergoing a similar rapid increase and expansion into new range in parts of Europe is probably more than coincidence.

Although most abundant along the seacoast, there is hardly a body of inland water too small to be visited occasionally by migrating herring gulls, and on all our larger rivers and lakes it is at times common. The farther south one goes, the higher the proportion of young birds to old, as first-year birds make the longest migration, mature adults the shortest. This gull's food, aside from that inadvertently provided by man, consists of fish, crustacea, marine worms, shellfish, sea urchins, insects, eggs (especially of sea birds, small birds, and mammals), and occasionally fruit like crowberries and blueberries. Some fish are caught by shallow plunges and some are stolen from more expert avian fishermen, but most are picked up at low tide in shallow pools on the mud flats or are found washed up dead. Worms, crustacea, and shellfish are often obtained by a rapid treading of wet mud or sand, which liquefies it and reveals these marine animals. Hard-bodied shellfish are carried aloft and dropped on a hard surface to break them open. Quite gregarious, herring gulls gather into large roosts at night on sheltered inland waters, islands, the upper reaches of a beach, or in secluded open fields or marshes. This is usually the commonest of the ship-following gulls, often balancing over the stern updraft and gliding along without a wingbeat. Seldom, though, do they follow a ship much beyond the continental shelf. Like many gulls, they seem to like to visit fresh water from time to time and are commonly seen flying back from the coast to some nearby body of fresh water, where they drink, bathe, and rest.

VOICE: The calls vary greatly in pitch, quality, and loudness.

The common note is a series of dry *kak-kak-kak* sounds, but when aroused the bird has a loud, trumpeting *kyow-kyow-kyow* in which the notes run together at the end.

NEST: (I. 26) Occasionally solitary but usually in colonies, often of considerable size, and frequently closely associated with colonies of other sea birds like the arctic tern or double-crested cormorant. Generally the birds nest on the ground, but they will resort to tree nesting if disturbed too much. The usual site is an open rocky or weed-grown island off the sea-coast or in a lake, also on sand dunes or headlands. The nest is a rough pile of seaweed and other rubbish with a shallow cup for the 3 bluish, greenish, or brownish eggs (2.8 x 2.0), irregularly spotted with browns.

RANGE: (P. M.) As explained under the preceding bird, it is hard in the case of the herring gull to determine what is a race and what a species. Gull populations currently regarded as belonging to this species breed around the whole Northern Hemisphere from the shores of the Arctic Ocean south to n. New Jersey, the Great Lakes, s. Manitoba, and n. British Columbia and abroad to s.c. Asia, the Mediterranean, and the Canary Islands. Winters south to the West Indies, Panama, c.w. Africa, and Indo-China.

California Gull*

Larus californicus—~~23~~
L. 21½

IDENTIFICATION: Regarded by some ornithologists as just an inland-nesting race of the herring gull, from which it differs only in its smaller size, the larger white area at the very tip of the black primaries, the greenish-gray or greenish-yellow legs, the pure-gray rather than blue-gray mantle, the black in addition to the red on the bill, and—the best field mark of all—the abruptly black ends to the wings when seen from below. First-year birds, although not quite as dark—i.e., streaked with more white, and with a more extensively flesh-colored bill, dark only at the tip—are doubtfully distinguishable. Second-year birds are even closer to herring gulls, although the legs may begin to show a greenish cast.

HABITS: In winter most of these gulls are found along the Pacific coast following ships offshore and feeding about harbors and bays with other gulls. Inland, especially during the breeding season, this gull obtains its food in the marshes and lakes where it nests and in the adjacent uplands over

which it ranges for many miles. Fish (like carp), crayfish, and other aquatic animals of shallow water are taken as available and occasionally birds' eggs are eaten, but grasshoppers, insect larvae and adult insects from freshly plowed fields, and at times mice and ground squirrels make up the bulk of the diet.

Gulls, because they range widely and are able to concentrate in enormous flocks, can be uniquely effective in bringing destructive outbreaks of insects or rodents under control. A dramatic instance of this was the sudden descent of thousands of California gulls on the fields of the early Mormon settlers in Utah when a species of long-horned grasshopper (the Mormon cricket) was destroying their crops. The birds were regarded as heaven-sent, and a monument was later erected to commemorate the occasion. Yet in spite of this and other proofs of their value, little has been done to preserve the colonies of these gulls or to establish them throughout the West within feeding range of agricultural land. We have not yet realized that the biological control of insects and rodents through wildlife management is far safer and cheaper in the long run than to continue year after year to load our soils with ever-increasing quantities of poisonous chemicals.

VOICE: Similar to that of the herring gull.

NEST: In colonies, generally large ones that are often shared with ring-billed gulls, on islands in fresh or alkaline lakes or marshes. The nests are often scrapes in the bare ground or among sparse vegetation, more or less lined with any sort of debris the gull can find, but occasionally a pile of material a foot or more high is collected. The 3 eggs (2.7×1.8) are olive-buff to buffy-brown, evenly spotted with brown.

RANGE: (P. M.) Breeds from e. North Dakota and s. Mackenzie south to Wyoming, n. Utah, and c.e. California. Winters on the coast of Texas in small numbers and from n. Utah and s. British Columbia south both inland and on the coast to s.w. Mexico.

Ring-billed Gull*

Larus delawarensis—~~23~~
L. $18\frac{1}{2}$; W. 48

IDENTIFICATION: The ring on the bill is the best field mark, but the clear yellow legs, black under sides to the wing tips, and the more delicate appearance of the whole bird separate it from an adult herring gull. Even first-winter birds are very light and spotted in appearance above and largely white

below and have a pinkish-flesh color on the legs and on the bill which is abruptly dark-tipped. Until fully adult the tail has a sharply defined narrow black band of even width across the end. (Second-year herring gulls, because of the light upper tail coverts, appear to have such a band but not of even width.)

HABITS: Regarded by Audubon as the commonest of American gulls, the ring-bill once bred on hundreds of inland lakes and marshes and in some coastal localities. It is rather intolerant of disturbance and with the encroachment of civilization gradually disappeared from many areas. However, ring-bills still breed virtually from coast to coast and have so increased in recent years that at one season or another they are fairly common in every part of the country. Inland they are often plow followers. Feeding habits are similar to those of the California gull. Many insects like grasshoppers are captured on the wing, as the ring-bill is very agile in the air and a graceful, buoyant flier. Along the coast it seems particularly fond of feeding on the beaches along the wave edge, where it captures crustacea in the wet sand, after the manner of a shore bird. It also follows ships and scavenges like any other gull and is often common about garbage and refuse dumps and wharves.

VOICE: Higher-pitched and generally more subdued than that of similar gulls.

NEST: In colonies, often associated with other gulls, terns, and cormorants. On the ground in the open or among rocks and bushes on islands, rocky reefs, or matted marsh vegetation. The nests of grass, weeds, and trash are usually up on high ground and have been reported occasionally in low trees. The 3 eggs (2.3 x 1.7) are buffy or olive-buffy, irregularly spotted and blotched with darker browns.

RANGE: (P. M.) Breeds from s. Labrador, James Bay, n. Manitoba, s. Mackenzie, and s. Alaska south to the Great Lakes, s. Colorado, n. Utah, and n. California. Winters from s. New England, the Great Lakes, Montana, and British Columbia south to Cuba and s. Mexico.

Common Gull*
(Mew Gull)

Larus canus—#23
L. 17

IDENTIFICATION: The small, almost ploverlike head and bill and the long wings that give the body a slim, tapered appearance are very noticeable. The greenish legs, unmarked yellow-

green bill, large white spots on the wing tips, and the slightly darker-than-herring-gull mantle are useful field characters. First-year birds are very dark and brownish. In the second year they lack the sharply defined tail band of the ring-bill.

HABITS: From its range it would appear that this Eurasian gull is a relative newcomer which, after crossing Bering Strait, is still in process of colonizing North America. In winter it migrates to coastal areas and has habits similar to those of other gulls, scavenging about harbors, dropping shellfish to break them, and treading the mud to detect worms and other animals. It is very active when feeding, often dropping repeatedly into the water from some height or dipping to the surface as it flutters along with dangling legs. At times it works the wave edge along the beach. It frequently occurs in flocks which, unlike those of larger gulls, exhibit much of the co-ordinated flock action of shore birds on the wing. Inland it is a plow follower and often frequents cultivated fields and grasslands for insects as well as feeding in lakes and marshes. The accuracy of Audubon's many records of this species along the Atlantic coast is now questioned, but in view of the regular occurrence of several other European gulls on our coast in recent years this one should be looked for carefully, especially among flocks of ring-billed gulls.

VOICE: The varied calls are shriller and often shorter than those of the larger gulls.

NEST: (I. 23) This species is flexible in its breeding habits. It nests inland about lakes or on islets in ponds in low, marshy country, but it also nests on cliffs or hillsides near the sea, on coastal islands and pebble beaches. Usually the colonies are small and solitary nesting pairs are not uncommon. The nest may be on the ground, on rocks, or in the tops of low trees. The 3 eggs (2.2 x 1.6) are buffy with brown markings.

RANGE: (P. M.) Breeds from n.w. Mackenzie and n.w. Alaska south to n. Saskatchewan and c. British Columbia and across Europe and Asia from the Faeroes, n. Scandinavia, n. Russia, and n. Siberia south to the Baltic and Caspian seas, Mongolia, and Kamchatka. Winters from s.e. Alaska to s. California and south to the Mediterranean and s. China coast.

Black-headed Gull*
(Brown-headed Gull)

Larus ridibundus—~~24~~
L. 15

IDENTIFICATION: This chocolate-brown-headed gull with its crimson bill and legs is 1 of 6 dark-headed gulls occurring in

North America. From August on, the head is white except for a dark patch over the ear and in front of the eye and often some brownish-gray on the crown. The white outer primaries above and the blue-gray wing lining and dark gray to blackish primaries below (except for a white outer one) are distinctive. Young have yellowish to flesh-colored legs and bills, the latter with a black tip; a black-tipped tail, and wings that show 4 bands of color along their upper surface—white, dark brown, pale gray, and finally dark gray along the rear edge.

HABITS: (Age 25 yrs.) In Europe this bird has adapted itself to civilization more completely than any other gull and is at home both along low-lying coasts and nearby harbors and estuaries and far inland on rivers, lakes, and marshes. It feeds in grasslands and crop fields, as well as in marshes, taking insects, earthworms, some weed seeds and waste grain, and other crop residues—often roosting at night in flocks in secluded, open fields. The black-head's flight is buoyant and almost ternlike in the way the body rises and falls, but it is heavier than the similar Bonaparte's gull and has more rounded wing tips. Like the Bonaparte's, it feeds by dipping to the surface with dangling legs but not alighting. Occasionally, however, it plunges into the water. It also hawks about high in the air after flying insects, tramples the mud for worms, and harasses ducks, coots, and other divers when they are feeding.

The scavenging opportunities offered by cities have been increasingly exploited in recent years by this species, which is now one of the commonest wild birds of many densely settled European areas; e.g., London. Black-heads feed around the docks and in harbors and inland on dumps, in parks, and wherever refuse is thrown. At night they gather in rafts on nearby reservoirs to bathe and sleep. In the past 50 years they have increased greatly, probably because of their ability to adapt themselves to man-made environments, and have spread to and established breeding colonies in Iceland. Every winter they occur in small numbers along our Atlantic coast, especially about harbors and inlets. Several birds banded in Europe have been taken on this side, and it seems possible that the species may eventually establish itself as a breeder on the western shores of the Atlantic.

VOICE: Harsh, often abrupt, crowlike, single *kwup*, frequently prolonged into *kwur-ir-ip*.

NEST: (I. 21) Along the seacoast on upper beaches and dunes,

as well as on open flats and marshes. Most of the colonies are inland on small islets and tussocks in marshes, bays, and reed-grown lake borders. Large colonies are the rule. The nests are a loose mass of material, varying considerably in size and placed on the ground, on matted-down vegetation or occasionally on rocks or even in bushes or trees. The 3 eggs (2.0 x 1.5) are buffy-brown with blackish markings.

RANGE: (P. M.) Breeds across Eurasia from Iceland, c. Scandinavia, n. Russia, and n.c. Siberia south to s. France, Sardinia, Albania, s. Russia, and Mongolia. Winters south to the Canaries, n.c. Africa, India, and the Philippines. It now occurs regularly in small numbers on our Atlantic coast, where it has been recorded from Greenland south to s. Mexico and the s. Lesser Antilles.

Laughing Gull*

Larus atricilla—~~24~~
L. 16½

IDENTIFICATION: The dark lead-gray wings with solid, blackish ends and a white rear edge are distinctive. In winter the head is largely white and the bill tip and legs less red. Young are very dark above and on the breast; have white upper tail coverts, a gray tail with a black subterminal band and white tip, and a blackish bill and legs.

HABITS: The laughing gull, the only breeding gull of the South Atlantic and Gulf-Caribbean area, is essentially a warm-water bird that seldom ranges into cold water at any season of the year. This probably accounts for the precariousness of its hold on the region north of Cape Cod where, with the recent increase of the herring gull, it seems likely to disappear as a breeding bird. It is less of a scavenger than most gulls and catches fish and shrimp in the shallows and crabs on the mud flats when the tide is out. It is, however, quite willing to steal what it can from pelicans and other hard-working fishermen. The laughing is definitely a coastal bird, although at times it ranges inland for fresh water on which to sit while it drinks, preens, and bathes. It likes to soar on thermal updrafts and often hawks about in the air like a swallow in pursuit of such insects as dragonflies. It is a common plow follower and after heavy rains visits fields to get earthworms. Away from the coast it is most frequently encountered along some of the larger rivers.

VOICE: The common call is a *ha-ha-ha*, given in flight, which at times sounds rather geoselike. The "laugh" is a long series

of such notes, the last ones prolonged, higher-pitched, and clearer.

NEST: Large colonies are the rule and they are usually on an island. The nest sites vary from sand dunes densely grown up to beach grass, weed and shrub areas, and high salt marshes to bare sand bars. The nest is often a well-woven, well-lined structure of grass and weed stems that raises the eggs above the tides. The 3 eggs (2.1 x 1.5) are brownish-olive, irregularly marked with brown.

RANGE: (P. M.) Breeds from Maine to the Lesser Antilles, Central America, and probably n. South America, and from Lower California to Central America on the Pacific coast. Winters from South Carolina to n. Brazil and s. Mexico to Ecuador.

Franklin's Gull*

Larus pipixcan—~~24~~
L. 14

IDENTIFICATION: The narrow white areas separating the black wing tips from the gray mantle are distinctive in adults even in fall, when the dark of the head is reduced to a dusky area from eye to eye across the back of the head and neck. Young have similar heads (very white on the forehead), but their wings are uniformly dark, the under parts clear white, the legs blackish.

HABITS: This gentle, trusting bird, rosiest-breasted of the dark-headed gulls, is often called "prairie dove" by the farmers whose plows it follows when it first comes north, just as the ice is going out of the lakes. Although these gulls eat many aquatic insects in both larval and adult forms, they get most of their food from crop fields, where they feed among stalks of growing grain. Throughout the breeding season the small bands of foraging gulls that travel out from the colony for many miles can be seen coming and going from dawn to dusk. Later, when the young are on the wing, the birds roam far and wide over the grasslands in great flocks, which in early fall are augmented by many Bonaparte's gulls. These flocks take an especially heavy toll of mature, egg-laying grasshoppers at the time most effective in reducing the next year's supply of grasshoppers. Yet instead of making into wildlife refuges the relatively small marsh acreage that the birds require for nesting, we have allowed these areas to be drained to produce small additional crops which may amount to little more than a fraction of the yield lost on neighboring

farms as a result of the higher insect population which inevitably comes when the gulls are absent.

Few gulls are as graceful on the wing as these birds that frequently hawk like swallows for flying insects. At times they whirl in the air in small flocks or soar to great heights, dive earthward, and repeat the performance like wood ibis. A teeming rookery of these birds is a never-to-be-forgotten sight. Unlike other gulls, Franklin's often take care of one another's offspring instead of killing them, and they live in harmony with eared grebes, ducks, terns, and blackbirds, seldom, if ever, succumbing to the egg-stealing tendencies of the rest of the gull family.

VOICE: This species has many soft clucking or mewing notes, but the most characteristic calls are shrill, clear, and rather mournful *week-a* or *po-lee* sounds.

NEST: The sites of the large breeding colonies these gulls usually form are very apt to shift from year to year. The location, however, is always among bulrushes or other reed-like plants growing in from 1 to 6 feet of water in a marsh or along a shallow lake shore. The nest is a large floating mass of old stalks, anchored among new or old growths and finished off with a dry, well-made cup for the 3 eggs (2.0 x 1.4). These are pale buff to olive-brown, variously marked with darker browns.

RANGE: (M.) Breeds from s.c. Manitoba and s. Alberta south to s.w. Minnesota, South Dakota, and Utah. Winters from the Gulf Coast of Louisiana and Texas south to the west coast of South America as far as c. Chile. A few individuals wander east every fall, at least as far as Lake Ontario.

Bonaparte's Gull*

Larus philadelphia—~~25~~
L. 13; W. 32

IDENTIFICATION: In summer this is a dark, slate-gray-headed gull with a very small black bill and bright orange-red legs and feet. The outer primaries are largely white, both above and below, and black only on the tip in adults. In young birds the whole wing has a dark-bordered appearance, the bill a light base, and the legs a dusky flesh color. This species is paler-winged than the Franklin's, and the primary coverts are white in all plumages.

HABITS: This plump, small-billed gull is very pigeonlike in appearance and very active on the wing. Its buoyant, somewhat bounding flight and habit of holding its bill pointed

downward suggest a tern. It occurs at one season or another in practically every part of the country, but the exact limits of its breeding range are not known. At one time it apparently bred south to the Great Lakes. Inland, where it is commonest in spring, it migrates along river valleys but prefers lakes, including the strongly alkaline lakes of the Great Basin, for feeding. Along the coast, where it is more abundant in fall, it feeds offshore over tide channels and rips and kelp beds. It also comes in at times to feed on tide flats, salt marshes, and ponds, and to scavenge in harbors and about sewer outlets. The travels of its loose flocks, which often comprise many thousands, are unpredictable and erratic, but in general its numbers seem to have declined in recent years. Bonaparte's feed largely by dipping to the surface of the water, but occasionally they drop into it. With each bird taking a few deep strokes, then gliding with dangling legs to the surface to flutter for a moment in one spot before bounding off again, a feeding flock has something of the appearance of a gathering of white butterflies. Small fish, crustacea, and some snails and marine worms are staple foods, but inland in summer the birds feed chiefly on insects which they capture in the air or pick from croplands (often from behind the plow) or from the surface of lakes or ponds.

VOICE: A harsh, high-pitched, ternlike *tee-er* or *cheer* and many weak conversational whistled notes when feeding.

NEST: About lakes and marshes in the spruce-fir forests. The nest is made of moss, lichen, grass, and twigs and is saddled on a horizontal branch from a few to 15 or 20 feet up. The 3 eggs (1.9 x 1.4) are pale buff to olive-buff, spotted and blotched with browns.

RANGE: (M.) Breeds from n. Manitoba, n. Mackenzie, and n.w. Alaska south to c. Alberta and c. British Columbia. Winters from s. New England to Florida, the Gulf Coast, and Yucatan, and from s.e. Alaska to the c. Mexico Coast.

Little Gull*

Larus minutus—~~26~~
L. 11

IDENTIFICATION: The completely blackish underwing surfaces of adults are distinctive. The wings of young birds in their first fall are white below and even in the second year are not as dark as those of adults, but they always show a bold, blackish, inverted, open V running through the length of the

upper surface, much like that on the wing of a young kittiwake.

HABITS: In Europe this bird, the smallest of all gulls, frequents inland marshes and marshy-bordered lakes during the nesting period. At other seasons it occurs both inland and along the coasts, especially about harbors, bays, and estuaries. Very active and graceful in flight, it might be confused with a tern were it not for its rounded wings. In feeding habits it resembles the other dark-headed gulls and often associates with them and with terns both on nesting grounds and at sea. It picks small fish and crustacea from the surface, and inland it relies largely on insects for food. Repeated close observation of large flocks of Bonaparte's gulls and common terns along the Atlantic coast and the eastern end of the Great Lakes invariably reveals a few individuals of this species. There is a marked westward movement of these gulls after the breeding season in Europe which may carry a few of them across the Atlantic, but some ornithologists believe that they may nest in North America in small numbers.

VOICE: A *kek-kek-kek* call or a higher-pitched, harsh *ka-ka-ka*.

NEST: In colonies in marshes, the grass and leaf nest being placed in a clump of emergent vegetation or on a floating mass of dead plant material; also occasionally on islands. The 3 eggs (1.6 x 1.2) are pale brownish to olive-brown, spotted and blotched with dark brown and ashy.

RANGE: (M.) Breeds from c. Sweden, n.c. Russia, and n.c. Siberia to the Sea of Okhotsk south to Holland, c. Russia, and Lake Baikal. Winters south to n. Africa, the Caspian Sea, and s. China. Rare but regular in e. North America, generally associated with Bonaparte's gulls.

Ivory Gull*

Pagophila eburnea—~~23~~ 23
L. 17

IDENTIFICATION: A pure-white gull with black legs and feet and a yellow-green bill becoming bluish at the base can only be an ivory. Young are grayish about the face, spotted with dusky olive, and have a blackish bill.

HABITS: This pure-white gull has long, broad wings and is a powerful flier, accustomed to traveling long distances for food. Although short-legged, the birds run about very actively on land or ice but do not seem to like to alight in water. On their breeding grounds they take lemmings and insects as well as crustacea and mollusks. During much of the year

they seem to follow such arctic mammals as seals, whales, and wolves, on whose dung they are known to feed. They also relish flesh and blubber and closely follow the Eskimo hunters.

VOICE: Harsh, shrill, and often ternlike notes.

NEST: In small colonies on bare, open ground or rock, or occasionally on the lower ledges of seaside cliffs. The nest is a pile of moss, lichens, and seaweed on top of which the bird deposits 2 buffish-olive eggs (2.4×1.7), marked with dark brown.

RANGE: (M.) Breeds in n. Greenland, the n. Arctic Archipelago north from Melville Island, n. Baffin Island, Spitzbergen, and Franz Josef Land. At other seasons it frequents the edges of the pack ice and adjacent coasts. It reaches our northern states and the coast of France only as a rare straggler.

Kittiwake*

Rissa tridactyla—~~25~~
L. 17; W. 36

IDENTIFICATION: The abruptly and completely black tips to the gray wings that pale toward the ends and the black feet are distinctive. The dark collar across the back of the upper neck and the broad, dark band through the wing identify young birds.

HABITS: The kittiwake is a truly pelagic gull that regularly drinks salt water; in fact, seems to prefer it. Probably it is the most abundant member of the gull family, as it breeds in enormous numbers throughout most of the Arctic and along the subarctic coasts. In the non-breeding season it is common over a very large proportion of the ocean area of the Northern Hemisphere. The long wings and long, broad tail give it a very fast and graceful flight. The wingbeats are rapid but not deep; the bird sails a great deal and usually hovers a moment before dropping to the surface to dive for food. Although kittiwakes follow steamers for days and gather about fishing fleets to pick up refuse, they are basically fishers, not scavengers. Their staple foods are small fish and especially the small plankton animals that drift with the ocean currents and also serve as the chief food supply for herring, mackerel, and whales. Of these the small pteropod mollusks known as "clio" and the euphausiid crustacea known as "kril" are among the most important. The kittiwake's ability to dive from the surface and swim under water, which is unique among gulls, enables it to obtain these animals with ease. Lacking the coastal ties of other gulls, this species seems

to avoid the immediate shore line and is not encountered until one is several miles out. In stormy weather the birds can often be seen from exposed rocky headlands or capes, but to see them at their best one should go out to the fishing shoals.

VOICE: The bird's name comes from its soft, pleasant *kit-ti-wake* call. When disturbed it utters a rapid series of shrill, harsh notes that vary in tone.

NEST: (I. 22) In large colonies on high cliffs, usually on island cliffs facing the sea but occasionally some miles inland. The nests are cups of moss and seaweeds securely fastened to ledges or mere rock projections on the perpendicular face. Sites where there is an overhang or cave are favored. The 2 eggs (2.2 x 1.6) vary from pinkish-buff to olive-buff or bluish-white, irregularly spotted with brown and blotched with gray.

RANGE: (P. M.) Breeds on the islands and shores of the Arctic Ocean south to the Gulf of St. Lawrence, n.w. France, and the Kurile and Aleutian Islands. Winters from the northern limit of open water south to the Sargasso Sea, the Cape Verde Islands, the Mediterranean and Caspian seas, Japan, and n. Lower California; occasionally the Great Lakes.

Ross' Gull*

Rhodostethia rosea—~~26~~
L. 13½

IDENTIFICATION: Winter adults lack the black neck ring, but at any season the pinkish color of the body plumage, although it varies in intensity, is, together with the clear gray of the back and both wing surfaces, quite distinctive. Young birds have the typical wedge-shaped tail of the species, a dark gray, slightly buffy rump, and a bold wing pattern.

HABITS: It is unfortunate that this most beautifully colored of all gulls is seen by fewer people than any other member of its family. After its brief 1½-month visit to its breeding ground it loses itself in the vast wilderness of the Polar Basin. Contrary to popular belief, this area is covered with a relatively thin layer of ice which is constantly in motion owing to the combined action of strong currents and the wind, thus producing leads of open water at all seasons of the year where gulls can readily feed. Only from Point Barrow, Alaska, where thousands are seen migrating to the Northeast in October, and Franz Josef Land, where they have been reported as abundant in August, have any num-

bers ever been seen. When inland during the nesting season they become insectivorous, but at sea small crustacea-like scud and other plankton animals that occur in arctic waters in such teeming abundance as to form a scum on the water, and some fish, are probably their staple foods.

VOICE: High and quite melodious single and double notes.

NEST: In small colonies on a high place in boggy tundra or on an island in a tundra lake. The substantial nest of grass, twigs, and lichens holds the 3 brown-spotted, olive-green eggs (1.7 x 1.3) a few inches above the water.

RANGE: (M.) Breeds in the valleys and deltas of a number of rivers in n.e. Siberia and possibly elsewhere in the Arctic. It has been recorded from almost every part of the Arctic Ocean and evidently winters about the open leads in the polar ice. South of the Arctic Ocean proper it is the rarest of accidental stragglers.

Sabine's Gull*

Xema sabini— $\#_{25}$
L. $13\frac{1}{2}$

IDENTIFICATION: The slight fork in the tail is not conspicuous, but the 3 bold triangles of solid color into which the upper wing surface is divided are characteristic of both adults and young.

HABITS: This gull is very abundant in many parts of the Arctic, especially about the coasts of Bering Sea. In the air it is graceful and ternlike, flying with a continuous wingbeat, dipping to the surface for food (never diving or dropping), and occasionally hovering for a moment. On the ground it runs about on mud flats, picking up food much like a plover, which at such times it closely resembles. Its food when nesting is largely insects. Later the birds feed along the beaches on crustacea and other organisms in the plankton scum deposited by the waves. Although lacking the gregarious instincts of most gulls and apt to occur singly or in small groups, favorable feeding conditions may bring them together in vast numbers, and at times they associate with the arctic and other terns in migration. This abundant bird is seldom encountered after it leaves the Arctic, which must mean that it becomes wholly pelagic and scatters out over the relatively untraveled warm oceans of the Tropics.

VOICE: A short, harsh, grating note like that of the arctic tern, also a squeaky, chattering, or chipping sound.

NEST: Singly or in small colonies in low, marshy, pond-strewn

tundra in close association with the arctic tern. The 3 brown to olive-buff eggs (1.8 x 1.3), spotted with sepia, are laid in a hollow in the damp ground in the most rudimentary kind of grass nest.

RANGE: (M.) Breeds on islands in and along the coasts of the Arctic Ocean south in North America to n. Hudson Bay and s.w. Alaska. In fall mass flights of many thousand are sometimes encountered off our Pacific coast and the French coast, and a few are seen in spring. Elsewhere it is a rare straggler, as apt to be encountered on the w. Great Plains as anywhere else, but there are records from almost every state. The only winter records come from off the west coast of n. South America.

Gull-billed Tern*

Gelochelidon nilotica—~~29~~
L. 14; W. 34

IDENTIFICATION: The short, heavy black bill, stocky body, slight fork in the tail, and the call notes are distinctive. Young have white heads, generally with a fine blackish streaking behind, as in winter adults, and a brown band on the end of the tail. Juveniles also have buffy edges to the feathers of the upper parts, some dark brown mottling, especially on the scapulars, and an orange-brown bill and reddish-brown legs.

HABITS: These terns were once extremely abundant in the salt marshes of the Atlantic coast from s. New Jersey to Virginia. By the early 1900s they had been practically wiped out by eggers and by the insatiable demands of the New York millinery trade. The species has never recovered, and only a few scattered pairs breed on the outer beaches in close association with other terns. It was originally a marsh nester like the Forster's tern and the laughing gull and was known as the marsh tern. In general its habits are more like those of the dark-headed gulls, and it nests inland in marshes and about lakes as well as along the coast. While gull-bills occasionally dive for fish and other animals in regular tern fashion, they are more inclined to stoop to pick things off the surface. Insects are apparently one of its staple foods, caught in the air or as the bird walks about on its rather long legs in crop fields or behind the plow. Grasshoppers are much sought after, and the birds often hover over a marsh fire to catch them. Next to insects, crustacea such as crabs and sand bugs (*Hippa*) seem to be their choice, but frogs, worms, lizards, and even small mammals are acceptable. The gull-

bill's flight is steady and heavy for a tern, but it stoops and maneuvers with all the precision of a swallow.

VOICE: The common call is a dry, rasping, insectlike *kay-ty-did* or *kay-did* and a short, single note repeated several times in rapid succession.

NEST: (I. 22, N. 30) A shallow, shell-lined depression or occasionally a substantial pile of plant stems and shells on an open, shell-strewn upper beach. Also on low, grassy marsh islands where the eggs are laid on the damp ground or on matted old grasses with little real nest. The 3 eggs (1.8 x 1.3) are creamy to buff, sparingly spotted with brown.

RANGE: (P. M.) Breeds all over the world in widely scattered colonies. In North America from the coast of s. New Jersey south to the Gulf of Mexico, West Indies, and s.e. Brazil; and from the Salton Sea in s. California south probably to Peru. Winters from the n. Gulf Coast and n. Mexico south to Patagonia and Peru. Also breeds from the Baltic Sea, c. Urals, and s. Mongolia south to n. Africa and Australia.

Forster's Tern*

Sterna forsteri—~~28~~
L. 14½; W. 30

IDENTIFICATION: The silvery-white primaries (paler than the mantle), pure-white underbody and wings, pale gray tail with white outer edges and a dark border inside the fork, and the rather yellowish-orange bill make adults fairly easy to identify. In fall both adults and young are unmistakable because of the black ear patches on an otherwise white head. Juveniles are quite heavily marked with buff and brown, both above and below, but this is largely gone by winter.

HABITS: For many years ornithologists failed to recognize this exclusively American species which, although it closely resembles the common tern, differs from it in many ways; e.g., in flight, Forster's moves its wings with a quick, sharp snap instead of with the slower, deeper strokes of the common. Forster's is an insect eater as well as a fisherman; it often hawks over the marshes for dragonflies and other large insects and can swoop gracefully to the water to pluck one from the surface without wetting a feather.

VOICE: The notes have a distinctive nasal quality, and are very different from those of other terns. Adults have a soft, even-pitched, buzzy *snee-e-e-e* that suggests a nighthawk's call, also a series of shrill *kit, kit, kit* notes, like a man clucking to a horse. Young make a shrill, squeaking sound.

NEST: (I. 23) Most commonly on the mats of dead canes drifted into the marsh at high tide. A substantial nest and nest cup of finer grass are built. Occasionally the nest is on a small marsh island on almost bare ground among grasses, with a sparse grass lining for the mud cup, or in a sandy place with bits of shell and grass for a lining. Inland the site is on floating mats of rotting reeds in a lakeside marsh or on top of an old muskrat house. The 3 eggs (1.7 x 1.2) are buff to olive-buff with small dark brown spots and lines.

RANGE: (P. M.) Breeds on the Atlantic coast from Maryland south to Texas and from c. Manitoba, c. Alberta, and Washington south to n.e. Illinois, n. Nebraska, c. Colorado, Utah, and s.c. California. Winters from South Carolina, the Gulf Coast, and c. California south to Guatemala. Occurs regularly in migration from the Great Lakes and New England southward.

Common Tern*

Sterna hirundo—~~28~~
L. 15; W. 31

IDENTIFICATION: The blackish primaries (darker than the mantle), the pure-white tail—dark only along the outer edge—and the orange-red bill, which usually has a black tip, are distinctive points. In fall and winter both young and adults are black from eye to eye around the back of the head but not on top, and have a dark band along the front of the inner wing. The bill darkens in winter but retains some red at the base, and the vermilion legs fade to a paler, more orange color.

HABITS: (Age 18 yrs.) This is the most widely distributed and often the most common of the 4 closely related terns that beginners find so hard to separate. When conditions are favorable it establishes huge breeding colonies, but these lead a hazardous existence and are often short-lived. The invasion of a colony by thoughtless humans, even when there is no intent to harm, may keep adults off eggs or young long enough for the hot summer sun to kill them. The presence of cats and dogs or "man's camp follower," the Norway rat, is nearly always disastrous to a colony, as is the presence of such wild animals as foxes, skunks, raccoons, opossums, or weasels. In the daytime terns put up a spirited defense against intruders and actually strike with their bills, causing considerable discomfort to humans and often death to young gulls or other small animals. Another danger is the presence

of ants that enter the eggs and kill the hatching young before they get clear of the shell. The greatest hazard of all is high storm tides that in a few hours can destroy thousands of eggs and young. Occasionally a sudden change in conditions at sea causes a complete disappearance of the small fish on which the terns depend for food for their young, and while the adults save themselves by leaving, the young starve to death. To compensate for these losses, the adults usually attempt to re-nest (either in the same place or elsewhere), until well on toward midsummer. Once on the wing, a young tern must survive 3 years before it is ready to breed and generally does not lay a full clutch of 3 eggs until its fourth year.

Few creatures are more graceful in the air than these fork-tailed birds with their deep wingbeats. They always enliven a water area, and fishermen often find them quite useful. They are attracted to the areas where mackerel or other large fish are forcing small ones to the surface, thus enabling fishermen to tell exactly where to set their nets. Furthermore, the birds' sense of direction is so unerring and the path of their homeward flight with their catch so direct that they often help guide the boats home through dense fog. Their food is small fish like sand launces, pipefish, menhaden, and alewives, plus plankton organisms like crustacea and, at times, insects.

Unless we give some thought to the preservation of suitable nest sites for these and other terns, they face an uncertain future along our coasts. Herring gulls, as they increase, are pushing terns off many islands, and in some areas the only surviving colonies are on "spoil-banks" created in the course of dredging inlets and harbor channels. With proper planning, many more of these artificial sandy islands can be created and kept free of vegetation for terns and other sea birds that require isolated coastal nest sites.

VOICE: The anger note is a harsh, piercing, rather prolonged *kee-ar-r-r-r*, with the accent on the first syllable and a drop in pitch at the end. Also a rapid series of short, high-pitched *kik-kik-kik* notes that under excitement become *keerr*, and a robin-like *chip*.

NEST: (I. 21, N. 30) Open sites like sandy or pebbly upper beaches or flat rocks on islands are preferred, but long peninsulas and other semi-isolated sites often suffice. Occasionally they nest among grass or weeds and bushes, but this is probably always on an old once bare nest site that the birds have fertilized so heavily that it has induced a heavy weed growth.

Sometimes windrows of drifted trash attract them, both on beaches and in marshes, and they have occasionally built floating nests on masses of dead plants in shallow water. The nest may be a substantial grass cup or little more than a hollow in the sand. The 3 eggs (1.6 x 1.2) are a pale brown, spotted with dark brown.

RANGE: (P. M.) Breeds around the world through much of the Temperate Zone of the Northern Hemisphere. In North America from the east coast of Labrador, c. Ontario, n. Manitoba, and s. Mackenzie south to the West Indies and possibly n. South America along the east coast, but only to s. Alberta, n. North Dakota, s. Wisconsin, and n. Pennsylvania inland. Absent as a breeder from the Pacific coast but a migrant from s. British Columbia south. Winters from Florida and w. Mexico south to the Strait of Magellan.

Arctic Tern*

Sterna paradisaea—~~28~~
L. 15½

IDENTIFICATION: The distinctly grayish under parts, becoming white only along a narrow line where they meet the black cap, and the deep blood-red bill without a black tip are fair field characters. Its tail is longer and more deeply forked than that of a common tern, and when perched its body is much closer to the ground. The bill is usually shorter and, in fall and winter, solid black, while the short legs darken to almost blackish.

HABITS: (Age 18 yrs.) This abundant tern of the Far North nests some 500 miles farther south on our East Coast than it does anywhere else in the world. Once the nesting season is over, the birds go to sea and winter in the oceans south of the equator, but it is now known that most of them do not reach the true Antarctic. The 22,000-mile round-trip flight from Arctic to Antarctic, formerly attributed to this bird, making it the long-distance migrant champion of the world, is certainly not characteristic of the entire population, though it may well be accomplished by a few individuals. When nesting the arctic tern feeds on insects, fish, and crustacea, the last evidently being its chief source of food at sea.

VOICE: The short *kee-ar-r* anger call is accented on the second syllable and rises in pitch. A high-pitched *kee-kee* is distinctive, as are other shrill squeaks or squeals and a grating *kikka-reek* call.

NEST: (I. 21) In large colonies, scattered groups, or single pairs

by themselves or associated with various other terns and gulls. Rocky and sandy coastal islands, beach and dune areas are common sites, but in the Far North they nest on islands in lakes, ponds, and marshes and occasionally in the open tundra. The 2 eggs (1.6 x 1.2) are brownish or greenish, irregularly marked with brown, and are laid in a hollow which sometimes has a grass, shell, or pebble lining.

RANGE: (M.) Breeds on the islands and coasts of the Arctic Ocean south to Massachusetts, n. Manitoba, n. British Columbia, and the Aleutians, and abroad to the British Isles, Baltic Sea, and parts of c. Siberia. Winters in the oceans of the Southern Hemisphere. Migrates at sea and is never seen along the Atlantic coast south of Long Island. There is every indication that many North American birds cross almost to the French coast before turning south. Off the Pacific coast it occurs south to s. California in fall but is seen only occasionally in spring.

Roseate Tern*

Sterna dougallii—~~28~~
L. 15½

IDENTIFICATION: This is a slender, nearly white tern with a long, pure-white, deeply forked tail that projects well beyond the wing tips when the bird is perched. Its bill is black except for a little red at the base (occasionally more). The rosy tint on the breast is seldom visible, but the notes are diagnostic and the flight notably buoyant. Young birds have fine brown streaks on the forehead and crown and conspicuously dark spotted under parts.

HABITS: (Age 7 yrs.) This most graceful of all terns is a strictly maritime bird, and the regions in which it breeds are widely separated. The plume hunters in the employ of the New York and Paris milliners nearly exterminated it in many areas during the latter part of the nineteenth century, and it is still a long way from being as abundant as it once was on the New England coast. The roseate feeds in salt water, largely on small fish, and often follows the schools of feeding bluefish that drive spearing and other species to the surface. It never occurs inland and is seldom seen in numbers along the coast except where nesting.

VOICE: The alarm note is a low-pitched, rasping *aaak* that sounds like tearing cloth. It also has a mellow, 2-syllable *chee-wee* whistle that suggests a ringed plover's.

NEST: (I. 21) In colonies on rocky, pebbly, or sandy areas on

islands or the shore, often in close association with other terns and gulls. The nests may be in the open or well hidden in long beach grass or weed growths. The scrape or hollow in the ground seldom has more than a sparse lining of dead grass. The 2 eggs (1.7 x 1.2) are pale buff to olive-buff with reddish-brown spots.

RANGE: (P. M.) Breeds in widely scattered coastal and island colonies on both sides of the North Atlantic, the Indian Ocean to s. Africa, and the Southwest Pacific region; in North America from Nova Scotia south to Venezuela and west to Texas and British Honduras. Winters from the Bahamas and the Gulf Coast to Brazil.

Sooty Tern*

Sterna fuscata—~~27~~
L. 16½; W. 34

IDENTIFICATION: The black above and white below pattern is unique among terns, as is the solid-brownish coloration of the young.

HABITS: (Age 18 yrs.) This is an extraordinarily interesting bird about which much is unknown and mysterious. Sootys are the most abundant nesting birds of the equatorial oceans, yet no one has ever encountered them in numbers away from known breeding colonies, out of which they may range as far as 200 miles to feed but from which they disappear after nesting. "Wide-awakes," as they are commonly called, are active 24 hours a day about their breeding colonies, nest relief and feeding usually taking place at dusk and during the night. Frequently they are heard about their breeding grounds at night some weeks before they are seen by day. Near the equator, where there are no marked seasonal changes, they often do not wait a year but return to nest every 9 or 10 months. The strangest thing of all about this largely pelagic sea bird is that it apparently has to avoid getting wet because its feathers are not waterproof. It apparently neither dives for food nor alights in the water, and as it has seldom been seen to use a perch it must remain continually on the wing. When feeding it swoops close to the water or hovers and snatches its prey from the surface or grabs it as it leaps out. Small fish and squids, both of which commonly jump out of the water to escape their enemies, are its only known foods.

VOICE: A harsh, squeaky, quacklike *quanck*, also a high-pitched 3-syllable call, often rendered as *ker-wacky-wack*, and many other barking, squawking, and snarling notes.

NEST: (I. 26) In colonies, often of fabulous size. The single egg is laid on flat ground or rocks or occasionally on ledges. Sometimes a hollow is scraped. The egg (2. x 1.4) is whitish, spotted and blotched with reddish-brown.

RANGE: (M.) Breeds on oceanic and coastal islands of the Tropics throughout the world. In North America from the Bahamas, Dry Tortugas, and formerly the Texas coast through the Gulf and Caribbean region, and on islands off the w. Mexican coast. Wanders with some regularity to our Gulf Coast. Hurricanes from time to time carry stray birds up the East Coast as far as Nova Scotia.

Bridled Tern*

Sterna anaethetus—~~27~~
L. 14½

IDENTIFICATION: The whitish collar across the back of the lower neck, the gray-brown (often quite pale) back, and the white line over and back of the eye are distinctive. Young birds are similar but barred and streaked above with white.

HABITS: Little is known about the habits or annual movements of this tern. It seems to prefer to feed well out to sea and is known to take small fish and squids. Whether it avoids contact with water like most tropical terns is not known, but its habit of perching on flotsam instead of swimming suggests this.

VOICE: Said to resemble certain high-pitched notes of the crow

NEST: In colonies, often with sooty terns and other sea birds.

The nest site is usually well hidden among broken rocks, in an erosion cavity in a rock face, or in a burrow entrance. The 1 egg (1.8 x 1.3) is white, spotted with shades of brown.

RANGE: (R.) Breeds on the islands of the Tropics throughout the world. In North America from the Bahamas to British Honduras and Venezuela and apparently off the west coast of Mexico. A regular visitor to the offshore waters of the east coast of Florida.

Least Tern* (Little Tern)

Sterna albifrons—~~29~~
L. 9; W. 20

IDENTIFICATION: The white forehead and yellow bill and legs are distinctive. In fall the bill becomes dusky to blackish, the legs dull yellow, and only the hind head and a line to the eye are black. Young birds are similar, with some sandy-buff above, and have quite dark wing coverts and primaries.

HABITS: When nesting this little tern does not require an isolated area like most other terns and is frequently found on mainland beaches; probably its more scattered colonies are less vulnerable to predators. Inland its preference for river sand bars often makes it a late nester, as these are not exposed until the spring floods recede, which may not happen until midsummer. In the Gay Nineties a market price of 10 or 12 cents each for their skins, to be used fully mounted on ladies' hats, was enough to almost exterminate the species, which was formerly abundant on our Atlantic coast. Enough survived, however, to re-establish it, once the growth of the Audubon movement relieved it from this type of persecution, and it is now the most abundant tern of the region, where it nests on beaches and land fill and other man-made sites. Its tolerance of disturbance and its ability to adapt itself to civilization enable it to thrive in regions where island nesters like the common tern are declining. The least's food, which seems to be derived entirely from the water, consists of fish and crustacea, for which it dives, usually after a preliminary hover.

VOICE: Very shrill and sharp. The protest call is a series of *kip, kip, kip* notes. It also has a *kit-tic* note and a harsh, rasping *cher-ee-eeep*.

NEST: (I. 20, N. 18) Broad, open sandy flats that are occasionally washed by high tides and are free of vegetation, new fill, river sand bars, and inland salt plains are usual nest sites. Commonest nesting associates are piping, thick-billed, and snowy plovers. The 2 or 3 buffy to olive-buff, brown-spotted eggs (1.2 x .93) are laid in an unlined hollow.

RANGE: (P. M.) Breeds throughout temperate Eurasia from the British Isles, Baltic, and Japan south to c. Africa, India, and Australia; and in the Western Hemisphere from Massachusetts, Iowa, and c. California south to Venezuela, British Honduras, and on the Pacific coast to s. Mexico. Winters from the Gulf Coast and Central America south.

Royal Tern*

Thalasseus maximus—#29
L. 19; W. 43

IDENTIFICATION: The tail is forked for about half its length and extends to or beyond the wing tips when perched. The slim bill is orange or yellowish-orange. The clear white forehead, contrasting strongly with the black of the crested hind head, is a good field mark for young and for adults except during the

short prebreeding courtship period, when the cap is solid black. Young birds sometimes have light orange-yellow legs, but those of adults are always blackish.

HABITS: (Age 6 yrs.) This large tern is a common sight everywhere along our southern coasts, fishing offshore or about inlets and bays. It feeds almost wholly on fish up to 4 inches in length, which are obtained by dives into the water, often from considerable heights.

VOICE: The ordinary calls are clear, shrill, and generally short. Some sound like *tsirr* or *kree*, but it also has a longer, melodious, rolling, almost ploverlike whistle.

NEST: Usually in large, densely packed colonies, often mixed with other species of terns on low, sandy islands along the seacoast. The 2 white to pale buff eggs (2.5 x 1.8), spotted with dark brown, are laid in a hollow scraped in the open sand.

RANGE: (P. M.) Breeds from Virginia to Texas and through the West Indies and on the Pacific coast of Mexico. Wanders north to New Jersey and c. California in late summer and winters from the Gulf Coast and s. California south to Argentina and Peru. It also occurs along the west coast of Africa from Gibraltar to Angola.

Sandwich Tern* (Cabot's Tern)

Thalasseus sandvicensis—~~28~~
L. 16

IDENTIFICATION: The long, yellow-tipped black bill is the best field mark of this long, narrow-winged, pale tern. The completely black cap is assumed before the courtship period, but the white forehead may return before the eggs are hatched. Immature birds are similar to winter adults, but earlier in the juvenile plumage the mantle is spotted with black.

HABITS: (Age 21 yrs.) This is a fast, powerful bird on the wing. It often feeds well offshore, diving from considerable heights which carry it well below the surface. Fish, shrimp, marine worms, and squids are among its known foods. In our region it is intimately associated with its close relative the royal tern, especially during the breeding season. On both sides of the Atlantic the Sandwich tern seems to be spreading northward in increasing numbers. In Great Britain it now nests among coastal dunes, on rocks, and occasionally on inland lakes.

VOICE: A very loud *kir-ritt* and a more abrupt *gwit, gwit*, less harsh and grating than with most terns.

NEST: (I. 23, N. 35) In colonies on bare, sandy islands and

beaches along the coast, usually in small groups among royal and other terns. The 2 eggs (2.0 x 1.4) vary from white to pinkish- or greenish-buff and are variously marked with blackish-brown. They are laid on the open sand with no nest.

RANGE: (P. M.) Breeds from Virginia to Florida, Texas, British Honduras, and the West Indies; and in Europe from the North Sea to the Mediterranean and Caspian seas. Winters from the Gulf Coast south to Colombia and Brazil and on the Pacific Coast of s. Mexico and Guatemala; and abroad to s. Africa and n.w. India.

Caspian Tern*

Hydroprogne caspia—~~29~~
L. 21; W. 53

IDENTIFICATION: A heavy, broad-winged tern with a short, only moderately forked tail and a stout, coral-red bill. In flight the undersurface of the primaries is almost black. The slightly crested head is solid black until fall, when it becomes streaked with white. Young are barred and spotted with black on back and tail but are otherwise much like fall adults, although the bill is often smaller and more orange and the head is first darker and then later in the season lighter than in adults.

HABITS: (Age 13½ yrs.) The big, ample-winged Caspian, largest of terns, looks very gull-like at a distance and soars readily, often going to great heights. It plunges for fish like most terns, but it also settles on the water to feed like a gull and occasionally robs other birds of their catches and eats eggs and small birds. When fishing it flies rather close to the water with bill down in typical tern fashion, but when migrating it is a high flier and carries the bill pointed forward. Least gregarious of terns, the Caspian moves about singly as a rule or in small groups. Throughout the range of the ring-billed gulls it seems to prefer their company to that of any other bird, not only nesting near them but frequently resting with them on the same sand bar at other seasons. North American Caspians do not seem to differ from those of Europe. A bird reared in Lake Michigan was found dead in England 12 years later, which gives evidence of at least an occasional interchange across the Atlantic.

VOICE: A hoarse, deep, almost croaking *ca-arrrrrr ka-ka-ka-kaow*, also a short *kow* or *kowk*.

NEST: (I. 21) In colonies, frequently close to large colonies of other terns and gulls, also singly or in a few pairs by themselves on a small islet. The site is usually a sandy or rocky

island, but the birds also nest on the heavy mat of dead floating vegetation near the shores of shallow lakes. The eggs may be laid directly on the ground, but often a fairly substantial lining and rim of grass, seaweed, or moss are provided. The 2 or 3 eggs (2.5 x 1.8) are pinkish-buff, lightly spotted with dark brown.

RANGE: (P. M.) Breeds in scattered colonies inland and along the coast of Europe, Asia, Africa, and Australia; and in North America from s. Labrador, the Great Lakes, and Great Slave Lake south to the Gulf Coast and c. Lower California. Winters from South Carolina and c. California south to Mexico.

Black Tern*

Chlidonias niger—~~27~~
L. 9½

IDENTIFICATION: The small size, short notched tail, and rather short broad wings, slate-gray above and paler below, are distinctive. The head and body are solid black only in summer, but at other seasons the head has a characteristic dark hood.

HABITS: The black tern is a bird of inland marshes and shallow lakes during the breeding season, that often feeds over adjacent grasslands and on occasion follows the plow. Its flight is buoyant and erratic, in tempo suggesting a nighthawk's, except for frequent hovering. The limited amount of suitable nesting habitat usually concentrates these birds into loose colonies, but until they reach the ocean in fall they are not notably gregarious. Along the coast they at first feed over salt marshes, but as they move south they join other terns on the bays and ocean. Inland grasshoppers, locusts, dragonflies, and many other insects, caught on the wing or picked from the grass or surface of the water, are staple summer foods, although a few fish, crayfish, frogs, and tadpoles are taken from the water in shallow dives. Once on salt water, the birds feed like other terns on fish, crustacea, and other marine animals, but they seldom dive deeply, preferring to pluck their food from the surface like the sooty tern.

VOICE: The normal call is a sharp, abrupt, somewhat metallic *kik*, varying in pitch, length, and intensity with the bird's mood, often becoming *sheep* or *kleearr*.

NEST: (I. 17) In marshes or shallow lakes on matted canes or floating masses of vegetation, also on old muskrat houses and old nests of other species. The nest is either a hollow in dead plant material or a sparse cup of stems that serves to keep the

eggs out of water. The 3 eggs (1.3 x .95) are olive or buff, heavily marked with dark brown.

RANGE: (M.) Breeds over much of the Northern Hemisphere. In North America from n. Vermont, Ontario, c. Manitoba, s. Mackenzie, and e.c. Alaska south to w. Pennsylvania, Tennessee, Missouri, Colorado, and c. California; in Eurasia from s. Sweden and n.c. Siberia south to s. Spain, the Caspian Sea, and n.w. China. Winters along the northern coasts of South America south to Ecuador, and in Africa south to Angola and Tanganyika. In late summer many fly directly to the nearest seacoast before starting south.

Noddy Tern*

(Brown Noddy)

Anous stolidus—~~27~~
L. 15

IDENTIFICATION: The round tail, brown color, and white crown are distinctive. Young are a paler brown that becomes gray-brown on the crown, which is bordered by a white stripe above the eye.

HABITS: The noddy is strictly confined to ocean areas with high surface temperatures. Near the equator, where there are no seasonal changes, individuals are found nesting in every month of the year. The elaborate nodding ceremony which the birds use as a greeting to one another and as part of their courtship is much in evidence about the colonies. They do their fishing near the colony, capturing their prey by swooping close to the water and seizing it without wetting their feathers. Drinking and bathing are similarly accomplished on the wing. Although they can, and occasionally do, alight and swim in water, they prefer to rest on exposed reefs, floating driftwood, or buoys. Small fish driven to the surface by underwater predators are staple foods.

VOICE: A harsh, crowlike *kar-r-rk* or *kwok-kwok*.

NEST: (I. 34) In colonies on islands where the eggs may be laid on bare rock or ledges or in nests of twigs and seaweeds supported on grass clumps, shrubs, or trees at heights up to 10 feet. The single dull granular egg (2.0 x 1.4) is buff, lightly spotted with lilac and brown.

RANGE: (P. M.) Breeds on islands of the tropical oceans north to the Bahamas, Dry Tortugas, Tres Marias, the Hawaiian and Bonin Islands, and south to Tristan da Cunha, San Felix Island, the Tuamotu Islands, Norfolk Island, and Madagascar.

SKIMMERS**Family Rynchopidae****Black Skimmer***

Rynchops nigra—~~34~~ 34
L. 18; W. 46

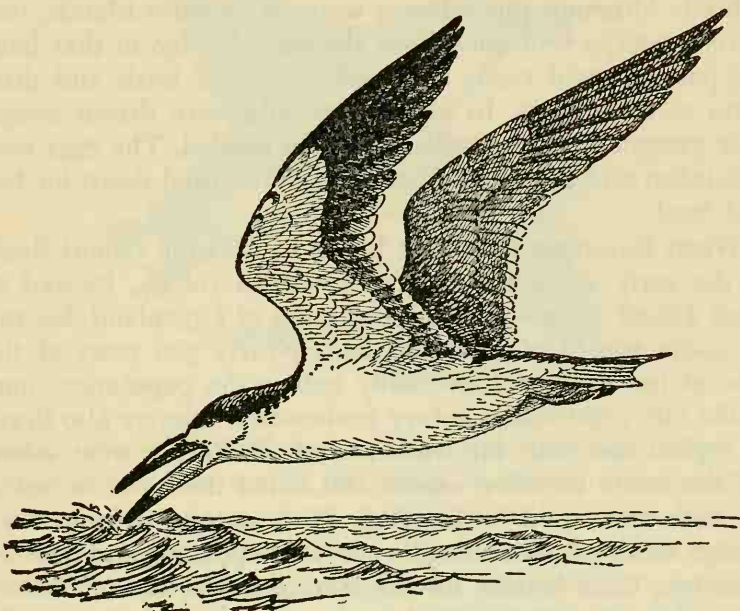
IDENTIFICATION: The black-tipped red bill with its elongated lower mandible, the long wings, and the black plumage are distinctive. Young are brownish, streaked above with white, and have more evenly matched mandibles. Their bills are dull orange.

HABITS: (Age 10 yrs.) This spectacular species, though it maneuvers in compact flocks with all the agility and synchronization usually seen only in shore birds, is not a strong flier and is one of the southern sea birds most apt to be carried north by hurricanes. Although confined to coastal regions in North America, this and other skimmers commonly frequent large rivers and nest on river and sand bars during periods of low water. The black skimmer has the curious habit of cutting the surface with the tip of its bill as it flies over water, but whether this aids it in obtaining food is a matter of dispute. One theory is that the bird creates with its immersed mandible a disturbance which brings to the surface fish which it picks up on the return trip that it usually makes over the same course. Like many other water birds that obtain food from near the surface, skimmers feed mostly at night or early or late in the day, when their prey rises closer to the top of the water. When not pressed for food for their young the birds spend much of the day resting in compact flocks on exposed sand bars. Along our coasts they are seldom found far from quiet bays, marsh channels, inlets, and river mouths. Fish and occasionally crustacea, the staple foods, are caught by sudden stabs as the skimmers fly over the surface or stand still in shallow water.

As the larger, higher islands along the coast are increasingly occupied by human settlements with accompanying cats, dogs, and rats, skimmers are forced to use low, sandy islands and temporary sand bars, where its colonies are continually being washed out by high tides or the whole site cut away by currents. For this bird particularly, the bare islands of sandy wastes often made by United States Army engineers in dredging river and harbor channels or canals through shallow bays have come as a godsend. Many of their present colonies are now on such sites.

VOICE: The resonant, throaty, barklike *kaup* and an angry *aaar* are quite unique.

NEST: In colonies, usually by themselves but often close to those of some other species of tern or gull. The site is generally a low, open area of broken shells or sand just above the tides, on an island along the coast. The 4 or 5 eggs (1.8 x 1.3) are laid in an open scrape in the sand and vary in color from pale bluish to buff, heavily marked with brown.



RANGE: (P. M.) Breeds from s. New England, Florida, and Texas south to c. Argentina on the East Coast and from Ecuador to Chile on the Pacific coast. Winters from North Carolina and the Gulf Coast southward.

AUKS, MURRES, and PUFFINS

Family Alcidae

Great Auk*

Pinguinus impennis—~~38~~
L. 29

IDENTIFICATION: The upright posture on land was very distinctive, and the bird was often called a penguin.

HABITS: All Alcidae have small wings which they use in swimming under water, but only in the great auk were they so modified for this purpose as to render the bird flightless. Until man appeared the great auk's evolutionary adaptation to ocean life and a diet of fish was highly successful. The bird was abundant and evidently had few enemies, since a single offspring a year was apparently enough to maintain a thriving population. From earliest times its colonies were a valuable food resource for residents of the bleak northern coasts where it bred. Although the colonies were on offshore islands, they were generally well back from the water's edge so that landing parties could easily surround groups of birds and drive them to their boats. In some cases auks were driven aboard over gangplanks to be kept alive until needed. The eggs were also taken and the birds themselves were salted down for bait and food.

When European fishermen began to visit the Grand Banks in the early 1500s the largest American colony, located on Funk Island 35 miles off the east coast of Greenland, became a regular source of food and bait. Nearly 300 years of this type of use did not appreciably reduce the population, until in the late eighteenth century professional hunters also began to exploit the birds for feathers and oil. Parties went ashore for the entire breeding season and killed the birds as fast as the carcasses could be handled. With no one to stop them, though some people realized what was happening and sounded warnings, these looters, for the sake of a few tons of feathers and some oil, exterminated a unique bird and destroyed a valuable natural resource.

VOICE: Said to have been a croak.

NEST: In dense colonies on rocky islands. The single egg (4.9 x 3.0) was deposited on bare rock. It was a dirty white, scrawled and blotched with gray, black, and brown.

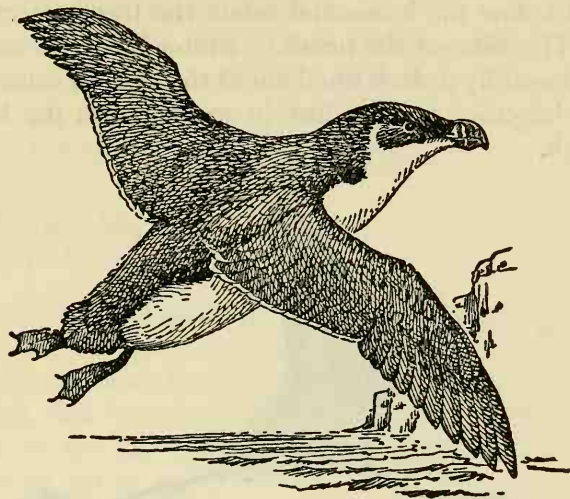
RANGE: (P. M.) Once bred on islands across the North Atlantic, probably from s.e. Greenland, Iceland, and Norway south to the Gulf of St. Lawrence and n. Scotland. Wintered south to Cape Cod and the Bay of Biscay, occasionally to Florida and Gibraltar. Last recorded in 1844 in Iceland.

Razor-billed Auk*
(Razorbill)

Alca torda—~~38~~ 38
L. 17; W. 26

IDENTIFICATION: The deep bill of adults, crossed by a white line, and the bird's habit of holding the rather long tail

cocked upward when in water are distinctive. Young have a much smaller, unmarked bill and are whiter about the head and neck. In flight the head is held in close to the compact body, with the bill pointed forward and the feet hidden by the tail.



HABITS: Razorbills, although seldom seen from shore except during the breeding season, are birds of coastal waters, concentrating and wintering on fishing banks or other favorable offshore feeding areas. Fish, shrimp, and squids are among their staple foods and are generally obtained close to the surface. Auks have, however, been caught in gill nets of fishermen at depths up to 60 feet. They swim buoyantly, with the head close to the body, and in migration fly in small groups in a single line not far off the water. They show little fear of man and are so curious that they can often be decoyed by loud noises or arm waving.

VOICE: None save a few hoarse, guttural croaks or growls.

NEST: (I. 30) In colonies with other sea birds on cliffs or among rocks and boulders. Individual nest sites are usually in cavities, crevices, or under deep overhangs and rocks. The single bluish- or greenish-white, strongly tapered egg (3.0 x 1.9) is spotted and blotched with brown or black and is laid on bare rock or loose stones.

RANGE: (P. M.) Breeds from s. Greenland, Iceland, and n.e. Russia south to Maine, Brittany, and s. Sweden. Winters south to Long Island and the w. Mediterranean and in small numbers to North Carolina and the Canaries.

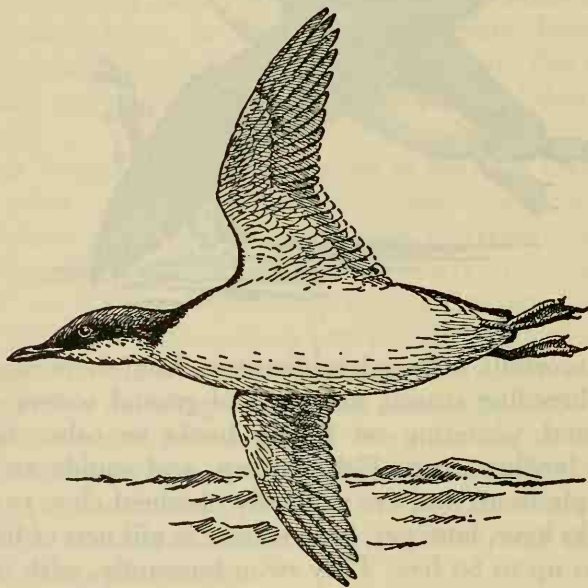
Murre*

(Guillemot B.O.U.)

Uria aalge—#38

L. 16½; W. 30

IDENTIFICATION: On water the narrow, sharp-pointed bill, smaller head and longer neck than a razorbill's, and the stubby tail are distinctive. In flight the head is fully extended and held below the horizontal while the feet project beyond the tail. The sides of the heads of winter birds are extensively white, crossed by a dark line behind the eye. In some individuals this becomes a white line in spring when the heads become dark.



HABITS: In many parts of its range the murre is tremendously abundant. It was once much commoner along the North Atlantic coast than it is today, records showing that at one time it appeared in numbers off New England. Easy to collect and good to eat, its eggs for years were an article of commerce, and the birds themselves were relished as food. The murre swims under water like other Alcidae, with wings extended, and lives on fish, crustacea, worms, and mollusks. Fishermen have caught them in gill nets at depths up to 180 feet. Like razorbills, murres seem to stay in coastal shelf waters throughout the year and are seldom seen in mid-ocean. The flight, which is swift but marked by frequent changes in direction, takes place close to the water except in migration.

VOICE: A prolonged growl or hoarse purr, varying in tone.

NEST: (I. 30) In close-packed colonies, often enormous, on rocky islands and cliff ledges. The strongly tapered eggs are laid wherever the rock is flat enough to keep them from rolling off. The single egg (3.2 x 2.0) is pale green or blue, variably marked with brown or black.

RANGE: (P. M.) Breeds around the shores of the Northern Hemisphere from s. Greenland, Iceland, Novaya Zemlya, and Bering Strait south to Nova Scotia, c. Portugal, c. California, and n. Japan. Winters south to Maine, occasionally to Long Island, s. California, and the Canaries.

Thick-billed Murre*
(Brünnich's Guillemot)

Uria lomvia—~~38~~
L. 18

IDENTIFICATION: In summer the shorter, stouter bill with a pale line along the gape, a pointed top to the white breast, and the color contrast between the top and sides of the head distinguish this species from the murre. In winter the sides of the head are less extensively white and the neck is not extended as far in flight.

HABITS: The thick-billed murre and its eggs are widely used for food, but owing to its more northerly range and the inaccessibility of many of its colonies, it is today a commoner bird in the western Atlantic than the preceding species. Although many individuals winter in the Far North near the breeding colonies, if water remains open this species regularly migrates south in small numbers and ranges out to sea farther than the murre or razorbill. Occasional eruptive flights have carried birds to the Great Lakes and down the coast to South Carolina. Fish, crustacea, and squids seem to be their chief foods, while the birds themselves are the chief food of the peregrines and gyrfalcons that nest on the same cliffs with them.

VOICE: A sheeplike bleat and other purring and croaking notes.

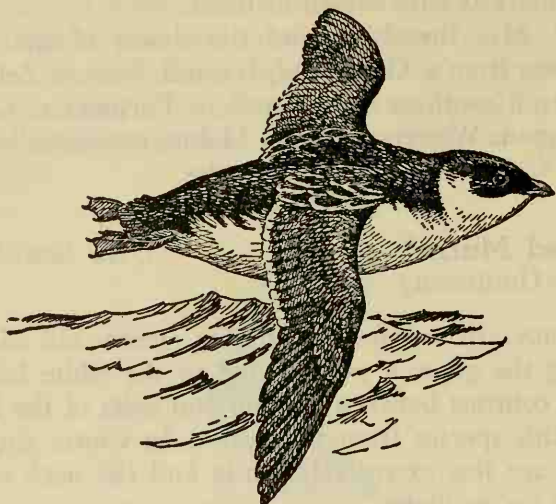
NEST: (I. 31) In dense colonies on sea cliffs, sometimes in close association with the preceding species. The single eggs (3.1 x 2.0) are laid on bare rock as close together as the birds can sit to incubate them. They are green-blue, heavily blotched and scrawled with browns.

RANGE: (P. M.) Breeds from the islands and coast of the Arctic Ocean south to n. Hudson Bay, the Gulf of St. Lawrence, and the Aleutian Islands. Winters south to s. New England, s. Alaska, and Japan.

Dovekie*
(Little Auk)

Plautus alle—#38
L. 8

IDENTIFICATION: This tiny, chunky alcid with a little bill, even less neck, and a buzzy flight is unique.



HABITS: The dovekie is one of the tremendously abundant northern sea birds that nest by the millions in favorable spots. Through it some of the bountiful resources of the nutrient-rich arctic waters become available for the support of fox, gull, falcon, and man. Easily caught with long-handled "butterfly nets," dovekies are staple food for many Eskimo tribes, which take them by the thousand. Like so many other arctic species, from fulmars to whales, these auks feed on the crustacea which abound in cold ocean water. Some of these crustacea are very small, but the dovekie has unique cheek pouches to aid it in carrying them back to its young. Except when nesting this species scatters out over most of the North Atlantic and becomes completely pelagic.

VOICE: A high-pitched chatter.

NEST: (I. 24) In congested colonies in the crevices of talus slopes of large broken rock fragments at the foot of cliffs. The single bluish-white egg (1.9 x 1.3) is unmarked and is usually laid several feet back from the entrance used by the birds.

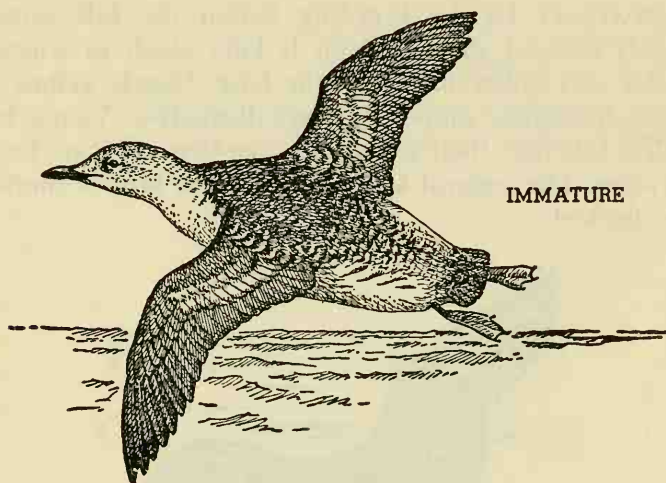
RANGE: (M.) Breeds north of the Arctic Circle from n. Greenland, Franz Josef Land, and Novaya Zemlya south to n. Iceland. Winters chiefly between the southern limit of pack ice and the Gulf Stream to the Virginia capes and the

Faeroes, with occasional irruptive flights carrying them to Cuba and the Canaries.

Black Guillemot*

Cephus grylle—~~38~~
L. 13

IDENTIFICATION: The large white area on the wing and the red feet are very conspicuous; they always identify summer adults in flight. Winter birds are whitish all over, which reduces the conspicuousness of the wing patch, which in young birds is mottled with dark. Guillemots take flight more readily than most alcids.



IMMATURE

HABITS: This species has none of the gregariousness of other alcids. Although widely distributed, only one to a few pairs are encountered in the vicinity of the average nesting place. This is a hardy bird and not much of a migrant. Often it remains near its breeding place throughout the year, even in the Far North, where it continues to feed under the ice, provided a few holes remain open so it can come up for air. Its attachment for a given feeding place seems to be so great that when it is disturbed by a boat it simply flies off in a circle and comes right back. Crustacea, shellfish, worms, and small fish like sand eels, captured under water or from rocky bottoms, are staple foods. It seems to avoid sandy areas.

VOICE: A weak, high-pitched, wheezy whistle or twitter.

NEST: (I. 24, N. 35) Not especially gregarious, this species nests wherever it can find a sheltered site under a rock or in a crack or crevice among boulder piles, talus slopes, or cliff

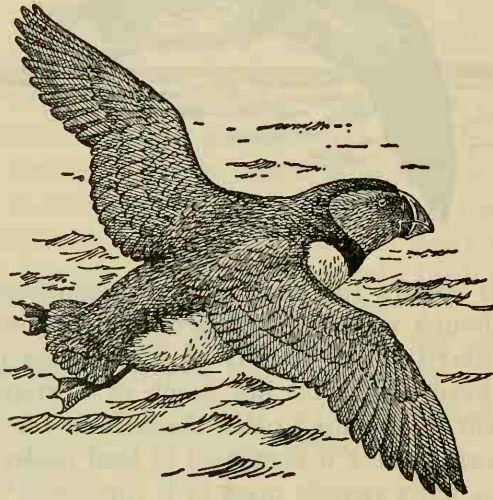
faces near water. The 2 eggs (2.3×1.6) are laid on bare rock or on loose pebbles; they are dull whitish, boldly blotched with various shades of brown.

RANGE: (P. M.) Breeds from the islands and coasts of the Arctic Ocean, except in n.w. North America, south to James Bay, Maine, Iceland, Ireland, and s. Finland. Winters in open leads and air holes of the Arctic Ocean and the North Atlantic south to n. Massachusetts and n. France.

Puffin*

Fratercula arctica—~~38~~
L. $12\frac{1}{2}$

IDENTIFICATION: In the breeding season the bill acquires a brightly colored sheath which is later shed; in winter it is smaller and duller brown at the base, largely yellow at the tip; its triangular shape is always distinctive. Young have so small a bill that their grayish cheeks become their best field character. The general appearance of the bird is chunky and short-necked.



HABITS: The puffin, though still common in many parts of the North, has declined greatly near settled areas. Tame and often curious, it is easily shot for food, though its eggs are not readily obtained. Like other burrow nesters—e.g., Leach's petrel—it is very vulnerable to mammal predators, and its colonies soon disappear from islands invaded by rats, cats, dogs, or foxes. It feeds largely in the coastal waters near its breeding grounds. Swimming under water with its wings, it readily obtains fish, mollusks, and a great variety of other

marine organisms. On land it walks easily in upright position and roosts on rocks and ledges near water when not fishing.

VOICE: A short, single growl or a series of 3 in descending pitch.

NEST: (I. 41, N. 49) In colonies of varying size on small coastal islands with sufficient soil covering to permit the digging of shallow burrows several feet long. The single, generally pure-white egg (2.5 x 1.7) is laid in a cavity lined with a little straw and feathers at the end of the burrow, which is either dug by the puffin or taken over from a petrel. The entrance is usually well concealed under a flat rock, and the burrow is much curved.

RANGE: (P. M.) Breeds from n. Greenland, Spitsbergen, and Franz Josef Land south to Maine, Iceland, Brittany, and Portugal and west to Novaya Zemlya and w. Sweden. Winters as far north as there is open water, usually near its breeding areas, but some birds go to sea and small numbers occur throughout the North Atlantic south to Massachusetts and the w. Mediterranean.

PIGEON-LIKE BIRDS

Order Columbiformes

PIGEONS and DOVES

Family Columbidae

White-crowned Pigeon *Columba leucocephala*—~~48~~
L. 13

IDENTIFICATION: The brilliantly white crown on the otherwise dark bird is distinctive. The crown is a pale gray on the somewhat duller females and dull sooty on the rather brownish-bodied young.

HABITS: Generally quite gregarious, these handsome pigeons nest and roost in great concentrations. Fast fliers, they often move about the country in large flocks and frequently travel great distances daily in search of food. They feed on the fruit of the abundant berry-producing trees and shrubs which in the

West Indies form dense jungles over vast areas of land unsuitable for agriculture, converting the berries into potential human food. The birds, however, have been so ruthlessly destroyed, especially about their nesting colonies and roosts on mangrove-covered islets, that much of the food they once consumed now goes unharvested. A typical example of man's thoughtlessness in killing off an animal that represents his only link to an organic product that is unavailable to him until it has been gathered and processed into meat by a living organism.

VOICE: Three short, deep cooing notes repeated several times, followed by a drawn-out, tremulous closing note, the whole performance sounding quite owl-like at times.

NEST: In colonies, often very congested ones, on small islands. The nest is a compact structure of twigs, lined with plant fibers, placed on top of a cactus, shrub, or tree from a few to many feet above the ground. Two white eggs (1.5 x 1.1) are the normal clutch.

RANGE: (P. M.) Breeds from the Bahamas and Florida Keys south through the West Indies to Dominica and on islands along the east coast of Central America from Yucatan to Panama. Largely withdraws in winter from Florida and the Bahamas.

Red-billed Pigeon

Columba flavirostris—#48
L. 14; W. 24

IDENTIFICATION: The 2 deep color tones of this broad-tailed bird give it a wholly dark appearance at a distance. Its only distinctive markings are the deep purplish-red middle coverts on the otherwise slaty wings. Females and young are less intensely colored and tend toward a dull wine and ashy tone.

HABITS: The red-bill is normally a pigeon of the mature forest, feeding on fruits and nuts high in the crowns of the taller trees. It is a solitary nester, but at other seasons it gathers into small flocks to roam the countryside in search of food. Like many birds of the tropical forests, these are most readily observed when they make their daily visits to water to drink and bathe. In recent years in s. Texas they have learned to visit the stubble fields to glean waste grain, along with other members of their family.

VOICE: Loud, clear cooing notes, generally rather abrupt and high-pitched.

NEST: A fragile structure of sticks, sometimes with a lining of

fibers, placed on a horizontal limb in a dense clump of vegetation, generally 6 to 12 feet from the ground but occasionally higher. The single egg (1.5 x 1.1) is white.

RANGE: (R.) Occurs from s. Texas and s. Sonora south to Costa Rica.

Rock Dove*
(Domestic Pigeon)

Columba livia—~~W~~48
L. 13½

IDENTIFICATION: Distinctive markings of this pigeon in its normal wild plumage are the white lower back and wing linings, the 2 black wing bars, and the tail band. Selective breeding in captivity has produced many individual variations in plumage color, but a population of freely interbreeding escapes seems gradually to acquire all the genes necessary to reproduce the normal color. Since normal genes are generally dominant over mutants, the entire group eventually returns to the plumage of the ancestral wild stock.

HABITS: Cliffs near water, especially along the seacoast, are the normal habitat of the rock dove in its native home. Here it is often closely associated with the peregrine falcon, which nests on the same cliffs and often feeds largely upon these pigeons. The rock dove is a ground feeder, frequenting the wrack line of beaches, wastelands, and grain stubble, where it obtains seeds, green food, and animal material.

About cities the bird is quite dependent upon handouts of bread crumbs from pigeon lovers. The generosity of such persons largely determines the size of the local population, since the species is so prolific that it invariably keeps its numbers at the approximate maximum the food supply can support. In a few cities urbanized crows take a toll of the eggs; in others peregrine falcons, nesting on the high ledges of office buildings and hotels, feed upon the birds themselves. But as neither crows nor falcons seem able to reap a harvest that can equal the rate at which pigeons produce young, they can hardly be said to exercise any real control over the population.

VOICE: The soft, often gurgling *coo* is well known.

NEST: (I. 14) A few bits of debris on a cliff or cave ledge. With the growth of cities these birds have utilized window ledges and crevices in ornamental stonework for nesting. They are indifferent to crowding, if not actually colonial, and will accept multiple-compartment birdhouses commonly known as dovecotes. The 2 eggs (1.5 x 1.1) are white and severa

broods are reared annually, the breeding season continuing almost throughout the year.

RANGE: (R.) Native to the islands of the e. Atlantic from the British Isles to the Cape Verdes and through s. Europe and n. Africa east to China. Introduced throughout the Temperate Zone by the escape of domestic stock.

Zenaida Dove

Zenaida aurita—~~48~~
L. 10

IDENTIFICATION: The brownish upper tail coverts and center of the black-banded square tail, the black-spotted inner area of the wing, and the white bar along the rear of the wing are distinctive. Females are generally browner and lack head spots. Young are similar, with a large pale russet area on the wing.

HABITS: This dove avoids dense forests but occurs almost everywhere else, in brushy growths, open woods, grasslands, and old fields—habitats that have greatly increased since the coming of civilization. Frequent visits to water appear necessary, and zenaidas seem especially common in the vicinity of coastal mangrove thickets and inland marshy areas. Most of their feeding is done on the ground, where seeds, green vegetation, and fruits can be picked up. When flushed they generally take off with a loud wing clapping but soon drop out of sight into the nearest dense cover.

VOICE: Cooing notes similar to, but often deeper than, those of a mourning dove.

NEST: On the ground, in reed beds, holes in rocks, and various sites in trees or shrubs. The nest is always a sparse structure of twigs and grass. The 2 eggs (1.2 x .90) are white.

RANGE: (P. M.) The Bahamas, West Indies, the coast of Yucatan, and occasionally s. Florida.

White-winged Dove*

Zenaida asiatica—~~48~~
L. 10

IDENTIFICATION: The bold diagonal white bar across the inner wing and the white corners of the rounded tail are distinctive. Young are similar to adults but grayer.

HABITS: These gregarious doves frequently occur in huge concentrations where extensive areas of junglelike thicket composed of tall shrubs and low trees are present to provide nest sites. Water must be available within 10 miles. Wild fruits,

nuts, and seeds are normal foods, but huge flocks gather after the harvest to feed in stubble fields on weed seeds and waste grain. Texas's two southernmost counties supported several million white-wings before the extensive agricultural development of the Rio Grande Valley destroyed much of their nesting habitat.

VOICE: The cooing calls are variable in tone and often quite musical, those of a large flock carrying for long distances. A common series of notes is 3 vigorous, abrupt hoots, followed by a prolonged *coo*.

NEST: (I. 18) Although they do nest singly, most nesting is in huge colonies, often many acres in extent. Dense thickets of mesquite, mangrove, or other low trees are the usual site, with the nests from 6 to 15 feet aboveground. A frail platform of loose twigs holds the 2 creamy-buff eggs (1.2 x .87). Two broods are often reared.

RANGE: (P. M.) Occurs from the Bahamas, occasionally Florida and the Gulf Coast, s. Texas, s. New Mexico, and s. California south to the Greater Antilles and Costa Rica. Also on the Pacific coast of South America from s. Ecuador to n. Chile. There is a winter withdrawal from the northernmost part of their range.

Mourning Dove*

Zenaidura macroura—~~48~~
L. 12; Wt. 4 oz.

IDENTIFICATION: The long, pointed tail bordered with white on a slim, brown bird with a small head is distinctive.

HABITS: (Age 9 yrs.) The changes wrought by civilization have been almost wholly favorable to the tame, confiding mourning dove that readily makes itself at home in close proximity to man. The weed seeds and waste grains of crop fields provide an abundant supply of its favorite foods, while shade trees, hedgerows, and wood-lot borders furnish it with cover for nesting and roosting. The planting of trees which serve as nest sites, the close cropping of pastures which leaves the ground rather open and bare—the way doves like it—and the development of ponds for watering livestock have made many areas of once open grassland much more favorable dove habitat. Like a number of other game birds, this one appears at times to benefit from our foolish abuse of land, as overgrazing and soil erosion lead to an increase in weeds (the seeds of which are good dove foods) at the expense of the more

valuable but poorer seed producers, the perennial range grasses.

After nesting large numbers of doves concentrate in favorable areas and use a communal roost at night, but there is no close flock organization. Daily mass flights to sources of water and grit are a regular feature of winter concentrations. Only a few doves remain in the northern states in winter, the greater number migrating to our southern states or on down into Mexico and Central America. Although ordinarily ground feeders, these doves occasionally take the seeds of opening pine cones high in the trees. During the breeding season they display a craving for salt and lime, which they often obtain by eating snails.

The mourning dove occurs in every state in the Union, but only in the South is it a game bird. In the North it can maintain itself in moderate numbers only if not shot, as here it suffers higher natural losses and has a lower rate of reproduction. The more severe winters make migration necessary, which shortens the breeding season and cuts the number of broods. Thus there are in the North no large numbers of surplus birds that hunters can draw upon without affecting the breeding population of the following year. Furthermore, in the South the hunting toll is spread between local birds and migrants, while in the North it falls entirely on the local breeding stock.

VOICE: A monotonously repeated series of long and short cooing notes varying considerably in pitch and very doleful in character. Also a rapid series of shrill, squeaky whistles when flushed into flight.

NEST: (I. 14, N. 11) A flimsy, flat platform of sticks lined with finer material. In treeless country doves nest on the ground, but elevated sites are undoubtedly safer and seem to be preferred. Fifteen to 25 feet above the ground is an average height, but sites may range from just off the ground in a bush to the top of a tall tree. A substantial horizontal limb or other solid support is sought, and the old nest of such birds as robins and grackles is often used as a foundation. Most nesting is solitary in isolated trees, but small, loose colonies are not uncommon. Conifers are often favored. The 2 eggs (1.1 x .85) are pure white. Three and occasionally 4 broods are reared, and although the breeding season often starts in February, the last nestlings may not fly until mid-October.

RANGE: (P. M.) Breeds from Nova Scotia, s. Maine, c. New York, s. Ontario, Wisconsin, Minnesota, Manitoba, and c.

British Columbia south to the Bahamas, Greater Antilles, and through most of Mexico. Winters from Massachusetts, s. Michigan, Nebraska, Wyoming, and Oregon south to Panama.

Passenger Pigeon

Ectopistes migratorius—~~48~~
L. 16; W. 24

IDENTIFICATION: The solid-gray head and the generally blue-gray appearance of the upper parts were distinctive. The male had a very reddish breast, while the under parts of the female were almost wholly pale gray.

HABITS: Probably no other bird has ever occurred in quite such huge concentrations as the passenger pigeon. Most writers who have left firsthand accounts begin with an apology for what they know will sound like exaggeration. John J. Audubon and Alexander Wilson estimated that the numbers they saw in the vast migratory flights that darkened the sky and took hours to pass exceeded either 1 or 2 billion birds. Before we dismiss these figures we must remember that the species had as its original habitat nearly a billion acres of forest, much of which eventually became highly productive farmland. This forest must have yielded vast quantities of such nutritious pigeon foods as beechnuts, acorns, and other tree seeds; fruits of all sorts; buds and such supplementary items as grubs, earthworms, and roots that the birds scratched out of the ground.

Pigeons the world over are largely fruit, seed, and mast eaters and forest dwellers. This species, evolving in the largest and richest of all forests, developed a mobility which enabled it to escape the hardships of winter and of regional crop failures. Home seemed to be where food was found. The birds had no rigid migration pattern but roamed the eastern half of the continent, stopping wherever they found something to eat and remaining until the supply was exhausted. During the breeding season they established nesting colonies miles in extent, in which each tree might have from a few to more than 100 nests. Such concentrations must have been in some way extremely favorable to the rearing of young to compensate for the enormous distances the adults had to travel daily for food. The birds also nested in scattered pairs and small colonies, but there are indications that such nestings were relatively unproductive; which may help explain the pigeon's rapid decline, once the destruction of the forest made the establishment of large colonies impossible.

It is difficult to understand the rapidity of this decline. True, the birds were harried the year round by market hunters, but generally the law of supply and demand makes such hunting impracticable long before a species is exterminated. It may be that the passenger pigeon's extreme gregariousness kept the survivors together almost to the end, or at least until the number was so small that a productive colony could not be formed—and as long as they were together they were, of course, very vulnerable to hunters. Apart from direct killing, there were other forces at work which might in time have doomed them just as surely. Year by year their habitat was shrinking before the ax, and in the South increasing numbers of competitors for their winter food supply—razor-back hogs—roamed the woods. Nothing, however, has really explained the swiftness of their disappearance.

One suggestion is that a large segment of the surviving population may have met disaster in crossing one of the Great Lakes in a storm or fog. Other theories involve the outbreak of an epidemic disease, possibly acquired from domestic pigeons or poultry, or the introduction to this country of a new disease or insect that suddenly spoiled vast segments of the mast crop. The chestnut blight which did eliminate the most valuable of all mast producers, the American chestnut, came some years later. Toward the end there were well-meant laws forbidding certain types of pigeon killing, especially in the breeding season, but in the face of the hunter's greed and the insatiable appetites of the great cities, they were seldom enforced.

The last great nesting, some 100,000 acres in extent, from which more than $1\frac{1}{2}$ million birds are known to have been shipped to market by railroad alone, took place in 1878. The last specimen was shot just 20 years later in 1898. The last survivor, a bird hatched and reared in captivity, died in a zoo in 1914 at the age of 29. Now that a chance to see one alive is forever denied us, we must be content with the accounts that have been brought together in such books as those by M. H. Mitchell and W. B. Mershon.

VOICE: The calls were loud and rather harsh chattering, clucking, or croaking notes that bore little resemblance to the cooing of most pigeons.

NEST: (L. 14, N. 18) Often in huge, congested colonies many miles in extent with many nests to a tree. One in 1871 in c. Wisconsin was estimated to have covered 850 square miles and contained 136 million nests. Small colonies, however,

were not uncommon, and occasionally solitary pairs nested. The nest was a frail platform of sticks supported in the branches of a tree. A single white egg (1.5×1.1) was the normal clutch.

RANGE: (M.) Bred from Nova Scotia, c. Quebec, James Bay, and n. Manitoba south to s. New England, Pennsylvania, West Virginia, Kentucky, Mississippi, and Kansas. Wintered from North Carolina and Arkansas south to n. Florida, the Gulf Coast, and c. Texas. Occasional stragglers or small flocks occurred far beyond these limits, north in summer to the Arctic Circle and south in winter to Cuba and s. Mexico. Now extinct.

Ground Dove

Columbigallina passerina—~~48~~
L. $6\frac{3}{4}$

IDENTIFICATION: The small size, short tail, and the extensive area of reddish-brown revealed when the bird takes wing are distinctive. Females and young are considerably paler, grayer, and less strongly spotted.

HABITS: This well-named little bird is usually seen on the ground where, with tail high and head nodding at every step, it searches for grass and weed seeds. It prefers open dry ground and has taken kindly to gardens, plowed cropland, overgrazed grasslands, and dirt roads, while still occurring in open pine woodlands, barren stony areas, and on beaches. Seldom fluttering away until almost stepped on, the doves zigzag off for only a short distance before dropping to the ground or perching in a tree. Very abundant in many areas, they have mysteriously disappeared from others where they were once common.

VOICE: A soft, mournful *coo-oo* rising at the end, repeated over and over.

NEST: (I. 13) Either on the ground in a scantily lined depression hidden among weeds or tall grass, or on a flat platform-like structure of fine plant fibers on a stump in a vine tangle or saddled on a low limb of a tree, or occasionally in the old nests of other birds. The 2 eggs ($.86 \times .64$) are white and 2 or more broods are reared during the unusually long breeding season.

RANGE: (R.) Occurs from Bermuda, the Bahamas, South Carolina, the Gulf States, s. New Mexico, and s. California south through the West Indies and Central America to c. Brazil and Ecuador.

Inca Dove**Scardafella inca*—~~48~~
L. 8

IDENTIFICATION: The scaled upper parts and the long white-bordered tail are distinctive. The wings when spread show extensive areas of reddish-brown.

HABITS: The Inca is a ground dove feeding on bare, open ground or under the sparse shrubs and cactus of semi-arid areas. It finds towns and the vicinity of any human habitation much to its liking, and in many regions it has become the most domestic of birds. It is now extending its range northward in response to the creation of these seemingly ideal Inca dove habitats. Gardens, lawns, parks, and chicken yards are favorite feeding grounds, and a source of water (so necessary to all pigeons) is seldom far away. It displays practically no fear of man and seems to prefer to nest close to centers of human activity.

VOICE: A monotonous, abrupt *coo-oo-coo* with a blowing quality.

NEST: (I. 14, N. 12) On a horizontal support some 6 to 15 feet above the ground, usually a tree limb but often a man-made structure. The nest is a flat platform of fine twigs and plant fibers with little or no lining. Not infrequently it is placed on top of the old nest of some other bird. The 2 eggs (.88 x .66) are pure white. As many as 4 or 5 broods may be attempted in a single season.

RANGE: (R.) Occurs from s.c. Texas, s. New Mexico, and Arizona south to n. Costa Rica.

White-fronted Dove**Leptotila verreauxi*—~~48~~
L. 12

IDENTIFICATION: In flight the rounded tail shows a narrow white tip on either side of the dark central feathers, and the wings have conspicuous reddish-brown linings. At other times the pale forehead and under parts are the most distinctive characters.

HABITS: This rather solitary dove frequents dense, moist woodlands, where it ranges from the treetops to the ground in its search for the fruits and seeds that appear to be its sole food. It is best located by its deep note, as it seldom leaves the woods, where it is hard to see in the thick underbrush and dense, leafy tree crowns. When flushed it makes a shrill woodcock-like whistle with its wings.

VOICE: A very low-pitched, long-drawn-out, soft *coo* or *whooo*, descending in tone.

NEST: A platform of sticks and plant fibers, generally from 5 to 10 feet above the ground in a dense shrub, low tree branch, or vine tangle. The 2 eggs (1.2 x .90) are cream-colored.

RANGE: (P. M.) Occurs from s. Texas, s. Chihuahua, and s. Sonora south through Central and South America to c. Argentina. Some withdrawal in winter from extreme northern parts of the range.

Key West Quail Dove*

Oreopeleia chrysis—~~48~~
L. 11

IDENTIFICATION: Because of its iridescence this species is quite variable in color, but the long white streak below the eye is characteristic. Young are bright cinnamon-rufous above and dull cinnamon on the breast, very unlike adults.

HABITS: This is the most northerly-ranging species of a large genus of Central American and West Indian ground pigeons. It is a bird of the heavily shaded but open forest floor beneath the dense tangle of low, scrubby trees that cover the dry hillsides and moist lowlands of its island habitats. Here it feeds on fallen fruits and seeds and resorts to secluded, well-shaded pools to drink and bathe. As it probably still occurs as far north in the Bahamas as the latitude of Palm Beach, Audubon's account of it as a summer resident of the Florida Keys that migrated to Cuba in winter seems quite reasonable. If the Bahama birds are at all migratory, this species may still occur from time to time on the Keys, although it has now been many years since it has been recorded in this area.

VOICE: A series of groaning notes, said to sound like *whoe-whoeh-oh-oh-oh*.

NEST: Apparently the nest may be a loose collection of leaves and trash in a hollow on the ground or a platform of sticks up to a considerable height in a tree. Two creamy-buff eggs (1.2 x .90) are a normal clutch.

RANGE: (R.) Occurs in the Bahamas, Cuba, and Hispaniola, and at one time appears to have bred on some of the Florida Keys.

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For kingfishers, water-thrushes, owls, woodpeckers, grackles, crows, ravens, the roadrunner, and all small land birds, consult Index to Audubon Bird Guide. This companion volume covers every bird of Eastern North America not found in this book.

